CB Action

AUSTRALIA'S ONLY CB MAGAZINE

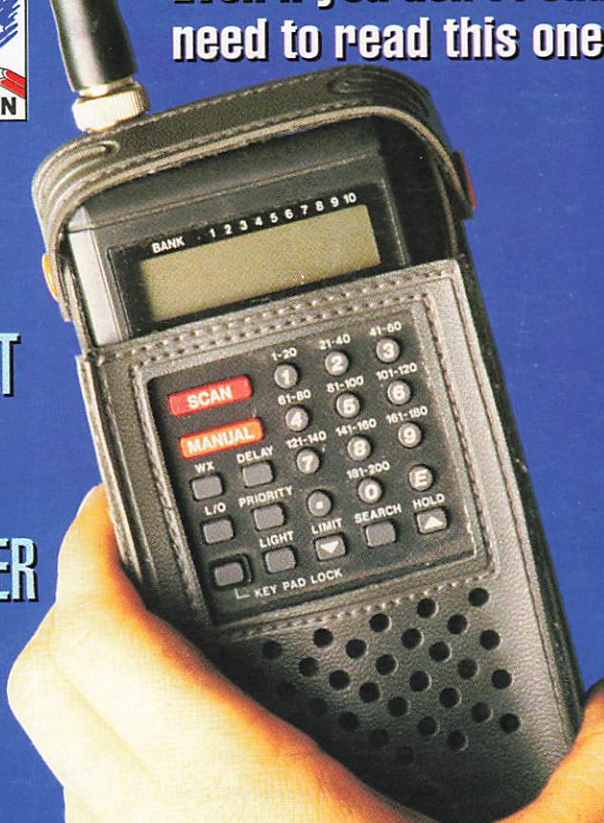
May/June 1993 $3.75

$150,000 FINE
or
TWO YEARS GAOL

Even if you don't read another issue this year, you need to read this one!

AUSTRALIAN PUBLICATION

WIN A BEARCAT 70XLT SCANNER



FEATURES:

CB vs Amateur Equipment (part 3)

Spectrum Management Explained

Novice Course- Part Six

27MHz Propagation Chart

Plus

"secret" scan freqs, shortwave info, comms related computer programs, book reviews, 27MHz DX...and a whole lot more.

ICOM

Count on us!

One of the largest selling and most popular UHF CRS handheld transceivers in Australia is also one of the smallest. The powerful Icom IC-40G is packed with features including 5 watt output, 12 memory channels for quick selection, scan operation, power save, plus the most comprehensive accessory system available.

monitor a priority channel (or channels) every five seconds while listening to another channel.

Other outstanding features include: Power Save, which automatically conserves power during standby conditions; Night Display Light; Dial Lock and Time Out Timer for prevention of accidental continuous

Icom Challenge the Belief that Everything Big is Better

More Powerful Performance.

To ensure effective performance, the IC-40G incorporates high sensitivity and full 5 watt output power. A Full Scan function repeatedly searches all 40 operating channels to find your desired channel immediately. And Memory Scan can sequentially search 12 memory channels, and skip unwanted channels..

The Best Things in Life Come In Small Packages

Another function on the compact IC-40G is Dual Watch. This operation allows you to transmission. Built rugged and encased in a tough, splash and dust resistant membrane cover, the IC-40G is ideal for professionals, enthusiasts and all outdoor applications.

A wide variety of options are also available including speaker-microphones, headset, battery packs, carrying cases, base charger, power adaptor and an advanced 5-Tone Selective Calling System can be easily installed at your Icom dealer.

For further information call free on (008) 338 915 or write to Reply Paid 1009 Icom Australia Pty Ltd P. O. Box 1162 Windsor Victoria 3181 Telephone (03) 529 7582 A.C.N. 006 092 575

L.L. Brown & Assoc. 3790

CB Action

Managing Editor:
Len Shaw (VK3ALS)

Advertising Managers:
Angela Taylor/Grant Manson

Production Manager:
Paula Parker

Editorial Office:
603-611 Little Lonsdale Street
Melbourne 3000.
Postal: GPO Box 628E
Melbourne 3001.
Telephone: (03) 601 4222
Fax: (03) 670 9096

Advertising Enquiries
Victoria (03) 601 4222
Fax: (03) 670 9096
New South Wales (02) 299 6271
Fax: (02) 299 7269
South Australia (08) 373 1142
Western Australia (09) 328 2539
Queensland (07) 202 6444

CONTRIBUTORS

Russell Bryant
PO Box 344
Springwood NSW 2777

David Flynn/Richard Jary
PO Box E160
St James NSW 2000

Greg Towells
P.O. Box 577
St Marys NSW 2760

Rob Williams
PO Box 108
Minto NSW 2566

Jack Haden
PO Box 299
Ryde NSW 2122

Ken Reynolds
1289 Nepean Highway
Cheltenham Vic 3192

Patrick McDonald
PO Box 357
Round Corner NSW 2158

Rod Fewster
P.O. Box 29
Kallangur QLD 4503

Contents

REGULARS

On Channel—Editor 5
Scanning Newcomers Start Here—R.Bryant ... 8
Bandspread—Greg Towells 14
Scan 1993—Russell Bryant 18
Online—Patrick McDonald 24
DXlogbook—Rob Williams 36
CQ CQ—Chris Edmondson 46
Comms Books Worth Reading—Staff 49
Spectrum Anarchy—Rod Fewster 51
HF Utilities—Richard Jary 53
WA Taxi Codes—"Radar West" 54
Acbro Action—ACBRO 56
Readers' Letters—Reader 58
DX International—Jack Haden 60
27MHz Propagation Chart—IPS 63
Repeater List—Staff 66

REVIEWS

Jebsee Antenna Rotator—Russell Bryant 40

FEATURES

Go Directly To Gaol—"Judicious Rex" 10
SWR - Let's Try It Again—Ken Reynolds 16
Novice Notes—Paul Butler 28
Time For A Change—Rob Williams 42

COMPETITION

Win A 70XLT Scanner—D.S.E. 64

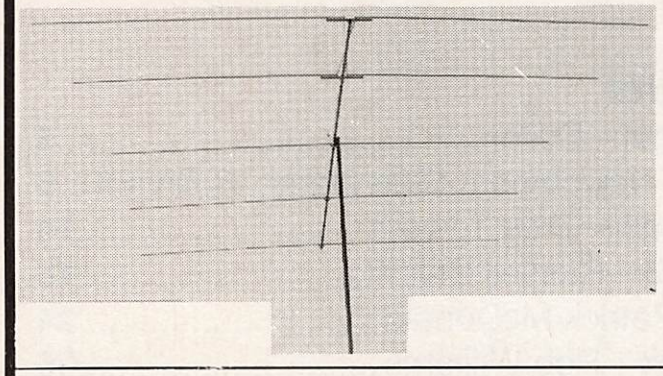
TET-Emtron ANTENNA SYSTEMS

MADE IN AUSTRALIA FROM BEST MATERIALS AND AT BEST PRICES

NEW "DUAL DRIVE" 3 & 5 ELEMENT BEAM ANTENNAS

This dual drive system uses a special feed arrangement which feeds the reflector and radiator elements. This method produces a wider frequency coverage (see SWR CURVE), higher gain and excellent F/B RATIO which is roughly comparable to adding an additional element to a conventional BEAM DESIGN.

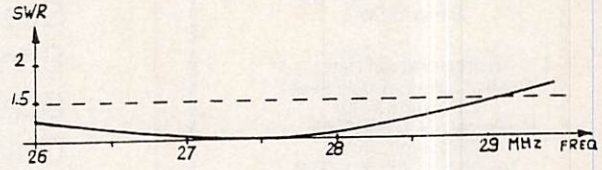
The performance of this new system exceeds even conventional YAGI-UDA DESIGN. TET-EMTRON ANTENNAS ARE MADE ONLY OF HIGH GRADE ALUMINIUM AND STAINLESS STEEL HARDWARE.



The "CB SUPER BEAM" TE-511HB DUAL DRIVE BEAM FOR THE DX-CONNOISSEURS IS HERE. COMPARE IT WITH ANY OTHER SIMILAR ANTENNA.

SPECIFICATIONS:

BAND ..... 26 to 29 MHz	GAIN ..... MIN. 10dBi/7.8dBd
F/B RATIO ..... 25 dB	POWER..... 2 KW
BOOM LENGTH..... 5 M	MAX. ELE. LENGTH..... 5.3 M



TWO BRILLIANT NEW RECEIVERS FROM LOWE

Top value for your dollar HF-225 only

$1425

Top portability, performance and value HF-150 only

$995

These two brilliant short wave receivers have multiple memories and filters, built in synchronous detector, latest technology, superior design and are the most user friendly receivers on the market. These receivers are made for listening.

AOR AR-3000A

NSW Government Contract No. 870/91

PROFESSIONAL RECEIVER FOR MONITORING & SURVEILLANCE

Features —

- ★ 100 KHz — 2.036 GHz continuous operation
- ★ Modes — AM, SSB, NBFM, WBFM, CW, DSB, AFSK, RTTY
- ★ Memory Channels — 400
- ★ Priority Channels 4 — Programmable interval
- ★ Scanning Speed — 50 channels per second
- ★ Tuning Rate - Variable from 50 Hz
- ★ Improved Sensitivity — 0.25 uV (2.5 MHz to 1.8 GHz)
- ★ Computer Control — RS232 Port
- ★ Large LCD Display
- ★ DC Operation — 13.8 volts. AC Transformer provided.
- ★ Superb Performances — 15 Band Pass Filters & GaAs FET RF Amplifiers
- ★ Programmable Pause Scan
- ★ State-of-the-Art Technology
- ★ Software for Computer Control

ONLY $1599

Electrophone:::

	BEST PRICES
TX472S UHF	
TX475	
TX830 Super Deluxe AM	
TX826 Deluxe AM	
TX821 AM Mobile	
TX287A 27MHz Marine	

POWER SUPPLIES

PSA 1210-10 amp-12 amp peak	$185
PSA 126-6amp-7amp peak	$129
PSA 123-3amp-4amp peak	$85

We Stock

ICOM

KENWOOD

Come and see us for the

BEST DEAL IN TOWN

FREQUENCY REGISTERS.....$20

GREAT CIRCLE WORLD MAPS $13

FAMOUS

Kenpro rotators IN STOCK

KR400	$499.00
KR400RC	$550.00
KR1000	$995.00
KR5400B	$1095.00
KS065 stay bearing	$99.00
Rotator cable $3.50 per metre 6 core	

unlden

	BEST PRICES
AX144 27MHz AM/SSB	
PRO 640E 27MHz AM/SSB	
PRO 520 AM Deluxe	
PRO 510 AM 40 ch	
UHO77 UHF Mobile	

SPECIAL

CO-AXIAL SWITCHES	RRP	SPECIAL
CX201	$49.00	$39.00
CX201N	$69.00	$59.00
CX401	$99.00	$89.00
CX401N	$125.00	$110.00

ACCESSORIES

- ★ Co-ax Cable RG58.....$1.00 pm
  RG213.....$3.00 pm
- ★ Meters Revex W560 1.6-525 MHz.....POA
  Revex W570 1.6-1300MHz.....POA
  EMTRON EP2000 1.6-60MHz
- ★ Co-ax Seal.....$6.00 per roll
- ★ Co-ax Switches 2 position
  4 position
- ★ Scanning Antennas — base
  DIAMOND D130 Discone.....$199
  DIAMOND D707 Active.....$299
- ★ Base Antennas Vertical 27MHz.....from $65
- ★ Base Antennas Vertical UHF.....from $79

BANKCARD MASTERCARD & VISA

EMTRONICS

MAIL ORDERS WELCOME

SYDNEY STORE & HEAD OFFICE
94 Wentworth Ave, SYDNEY
PO Box K21 HAYMARKET, 2000
Ph: (02) 211 0988 — 3 lines
Fax: (02) 281 1508

VICTORIA
288-294 Queen St,
MELBOURNE 3000
Ph: (03) 670 0300
(03) 670 8551
Fax: (03) 670 0871

QUEENSLAND
633 Logan Rd,
GREENSLOPES 4120
Ph: (07) 394 2555
Fax: (07) 394 4316

WEST AUSTRALIA
Shop 3, 443 Albany Hwy,
VICTORIA PARK 6100
Ph: (09) 470 1118
Fax: (09) 472 3795

NZ AGENT
Pottinger Business Services
Ph: 4-567 1842
Fax: 4-567 1842 (request)

ON CHANNEL

GO DIRECTLY TO GAOL

The big news at this time is, without argument, the fast approaching introduction of the new Radiocommunications Act. It might be some time before the results of this horrendous piece of legislature begin to be felt, BUT, you can rest assured that they will play some part in your future communications activities - be you a scanfan, CBer, amateur, short wave listener, retailer, technician or whatever.

As you will read in the report by "Judicious Rex" who is, incidentally, a very well qualified practicioner of the law, the penalties for falling short of the new Act's requirements may well result in some of you spending time as a guest of Her Majesty.

This is no exageration - the new Act provides for sentences such as you wouldn't believe - but had better start believing pretty damn quick!

We really won't know how the new Act will be enforced until such time as it becomes law (some time later this year) and even then we will probably have to wait for a court case or two to find out just how whether the penalties will be enforced. Make no mistakes though, the Act is very specific and there is every chance that it will be taken to the literal "letter of the law".

There seems little doubt that "go anywhere" scanners will, in time, become illegal, but, the same might well apply to HF communications receivers, etc.

It will be a brave (read stupid) operator who continues to run an amateur transceiver on 11m. It will also be an equally stupid amateur who has a transceiver which has been "snipped" to transmit anywhere - including the RFDS and marine bands.

We'll keep you informed of developments as they happen.

SPECTRUM MANAGEMENT AGENCY

The people who will be enforcing these new regulations will be part to Spectrum Management Agency - the latest "Big Brother" to start looking after our affairs. It appears frequencies, maybe even bands, will be for sale and/or auction and, being extremely valuable "real estate" we are left to wonder how the SMA will view CB and amateur bands.

Rob Williams has had a good look at what this new agency will be doing and it makes for some interesting reading.

AND MORE

It must be a sign of how tight things are when we couldn't locate even one new piece of communications equipment for review, however, there is a whole lot of interesting reading which covers everything from West Australia taxi codes to the what's being heard by way of international 11m DX.

One of the most regularly asked questions of us is "what's the best frequency register"?

In consequence (and mainly because we were getting tired of discussing the merits of each on a daily basis), Russell Bryant has done a major review of registers along with his usual rundown on frequencies. He has also reviewed a low-priced rotator which will prove of interest to many readers. There's all our usual columns, a few book reviews, a propagation forecast - and more. Enjoy the read.

CB Action

SUBSCRIPTIONS:
PO Box 257C
Melbourne, Vic. 3001

Surface Mail:	Australia	$22.50
	NZ, PNG, Asia	$32.10
	Other	$35.70
Airmail:	Australia	$32.70
	NZ & PNG	$37.50

ADVERTISING:
Victoria:
Angela Taylor - Grant Manson
(03) 601 4222

New South Wales:
Norman Palmer, Syme Magazines,
Melbourne Age Office, 7th floor,
50 Margaret Street, Sydney 2000.
Phone (02) 299 2671 Fax (02) 299 6474

South Australia:
Tony Giuliani, Cumberland Media
12 Eaton Street, Cumberland Park,
SA 5041. Phone (08) 373 1142

Western Australia:
Frank Hall Media
4th Floor, 102 James Street,
Perth. Phone (09) 328 2677

Queensland
Geoff Horne Agencies
PO Box 247,
Kenmore 4069
Phone (07) 202 6444

TYPESET AND DESIGN
BINT Services
38 Granya Grove, Mt Eliza 3930.

PRINTING BY:
Hannanprint Victoria
504 Princes Highway
Noble Park, Vic. 3174.
Phone (03) 795 3333

PROPRIETOR:
Syme Magazines, a division of Syme
Media Pty Ltd, A.C.N. 004 765 164
at The Age, 250 Spencer Street,
Melbourne 3000.

CB Action is distributed in Victoria by Magdiss Pty Ltd. 250 Spencer Street, Melbourne, 3000; in SA by John Fairfax & Sons Limited; in Tasmania by the Mercury, 93 Macquarie St, Hobart 7000; in NSW, Queensland, WA by Newsagents Direct Distribution Pty Ltd , 180 Bourke Road, Alexandria 2015.

The price set out or referred to herein is a recommended price only and there is no obligation to comply with the recommendation. All prices referred to in CB Action are recommended prices, unless otherwise stated.

The publisher's terms and conditions are set out in its current Advertising Rate Cards, which are available on request. They include an exemption clause, a monetary limitation of liability clause and an indemnity from the advertiser and any advertising agent. Advertisers and agents are advised to read the Card before placing any advertisement or series of advertisements

CB Action regrets that it is not possible to verify information other than that conveyed in editorial content of the publication. Although CB Action uses it best endeavours to ensure the accuracy of everything it publishes, the Fair Trading Act 1985 requires CB Action to disclaim any belief in the truth or falsity of information which is supplied to it and which is published in other than editorial content.

Antennas that Outperform the rest

Bandspanner™

SCATX 100cm transcanning antenna

Introducing the Bandspanner. The antenna to compliment today's wide band scanning transceivers and receivers. This is the antenna that is all things to all radios. It transmits on the air band, low band VHF, UHF commercial & CB bands and provides greater range performance than other mobile scanning antennas. The 27MHz to 1300MHz receive range is obtained by incorporating a wide band UHF whip and adding helical traps for the lower frequencies. Mount it mobile on our magnet or to our standard 5/16" threaded UHF base and coax assembly for trouble free performance well beyond the five year "No worries warranty". DICK SMITH CATALOGUE NUMBER D4437

$29.95

SCANNING Mobile Amateur

SCBASE

Portable scanning base antenna

Scanning just keeps on getting easier. This antenna is perfect for the scanning enthusiast on the run. Especially suitable for today's wide band scanners, the SCBASE can be hung on a hook indoors or lowered from the window and connected up for instant reception in areas difficult to install permanent antennas. The antenna is actually a number of dipoles for various frequencies bundled into a neat PVC package and fed with 3.6mtrs of RG58 coaxial cable. The SCBASE antenna is supplied with a BNC connector that plugs straight into most modern wide band scanners. Do not forget that only Mobile One backs up their scanning antennas with the five year "No worries warranty".

DICK SMITH CATALOGUE NUMBER D4432

$49.95

SCANNING Base Station Emergency Aeronautical Hand Portable

Mobile One products are available at Dick Smith Electronic stores an
For further details call 046 556677 fax 046 556600 or write to Locke

All prices quoted are recommended retail only and are subject to change without notice

27 MHz CB

SUPERHELICAL DX160SOBPK $69.95

The Superhelical is now available in a kit with everything you need to create the best 'value for money' mobile DX station available. The rugged 60" (1.53m) medium-duty long range antenna kit comes complete with Superhelical™, spring, base and coax suitable for easy installation for rugged off-road applications. Mobile One's Superhelical is the original helical that revolutionised 27MHz mobile communications in the early 1970s by reducing the length without reducing performance, and has yet to be bettered. The pitch of the antenna's copper winding over the tapered fibreglass former provides an exceptional bandwidth of 1.1MHz under 1.5:1 SWR with a lower angle of radiation for DX communications. The antenna is protected from the elements by means of a generous coating of polyolefin heatshrink and non-ferrous component parts making it suitable for marine applications as well.

This antenna will outlast and outperform any other 27MHz antenna of the same length guaranteed by our five year "No worries warranty".

DICK SMITH CATALOGUE NUMBER D4088

Five Year
No worries warranty
on all antennas

SKIPWHIP

1.8mtr DX270SAMPK

Heavy duty off-road antenna kit

If you have the need for a rugged antenna that won't let you down when the going gets tough then don't look any further than the Super Spring Skipwhip. It is available in a complete kit form that contains the heavy duty injection moulded ½" threaded Super Antenna Mount, cable and connectors. The heavy-duty spring is an integral part of the whip and provides protection from vibration and slow impact. The antenna is constructed on a solid tapered fibreglass former and wound with virtually indestructible ¼" braided copper to withstand the wear and tear of off-road driving. The Skipwhip is finished in a rugged ultra-violet secure polyolefin heat shrink to ensure that it is absolutely the best value for money antenna available. The Skipwhip will still be performing long after the five year "No worries warranty".

DICK SMITH CATALOGUE NUMBER D4078

$149.00

herever quality communications equipment is sold
ag 10 Camden New South Wales Australia 2570

MOBILE ONE
COMMUNICATIONS SYSTEMS
A.C.N. 001 885 696

SCANNING

NEWCOMERS START HERE

Scanning is basically the VHF/UHF version of shortwave listening. Whilst there is no special language associated with scanning, there are a few phrases and terms that may confuse the newcomer.

While it is not necessary to understand or even know what these terms mean, it does enhance one's enjoyment of the hobby if you obtain a basic knowledge.

Anyone who purchases a scanner can find out enough information on the basic operation of the receiver from the accompanying handbook or magazines such as CBA.

However, there are a number of words that may not mean a lot to the newcomer, or have significance outside the engrossing hobby of scanning.

Unlike other aspects of hobby radio, such as amateur and CB, scanners do not require any licence, either to purchase or operate.

Apart from transmissions which are in some way connected to a telephone conversations, scanner enthusiasts are free to monitor whomever they choose.

This page is designed to introduce you, the newcomer to scanning radio receivers.

One of the first things that you will come across are the different types of transmission ***MODES***, such as ***AM*** or Amplitude Modulation...it is found mainly on 27 MHz CB and VHF/UHF aircraft frequencies.

The primary mode encountered, however, is ***FM*** or Frequency Modulation.

FM comes in two types, narrow band, which is for normal two way radio transmissions and wide band which is used for TV audio transmissions and FM broadcast stations.

A portion of the radio spectrum is called a ***BAND.***

Bands are made up of ***MEGAHERTZ*** (usually shown as MHz) and ***KILOHERTZ*** (usually seen as kHz).

As far as the scanner owner is concerned, the main bands are ***VHF*** (Very High Frequency). The VHF band embraces all frequencies between 30 MHz and 300 MHz while frequencies between 300 MHz and 3000 MHz are known as ***UHF*** (Ultra High Frequency).

Some scanners can receive ***HF*** (High Frequency) which are the frequencies between 3 MHz and 30 MHz.

There are many type of users through out the spectrum.

AERONAUTICAL MOBILE is for the exclusive use of aircraft and associated services while ***MARITIME MOBILE*** is for the exclusive use of marine craft and associated services. ***LAND MOBILE*** is for services where both stations are terrestrial, or land based.

As the scanner has become more and more sophisticated, other radio bands, such as space to earth, earth to space communications can now be monitored.

However, for the main we will stick to the three standard user types.

Many operators in the Land Mobile bands use ***REPEATERS.***

A repeater is a combined receiver (using one frequency) and transmitter (on a second frequency) which retransmits the received signal in real time...this is known as a ***DUPLEX*** system.

Others use ***SIMPLEX*** frequencies.

Simplex is the method in which two way transmissions are made on the same frequency, for transmit as well as receive.

Transmitters (including handheld, mobile and fixed) are rated in ***WATTS.***

A watt is a unit of power and the more watts the better the signal.

Scanners have the ability to ***SEARCH*** out new and interesting frequencies.

An upper and lower frequency is programmed into the receiver and this then seeks out active frequencies within the assigned limits.

If there is a frequency that has special status it can be entered into a ***PRIORITY*** channel.

The scanner will then sample that channel at regular intervals (programmed by the operator) for activity.

This process will overide any other functions being carried out at the time. If a channel is carrying too much traffic or is subject to interference which may cause it to continually open the ***SQUELCH*** control, it can be ***LOCKED OUT*** of the scan sequence.

To open a scanner's microprocessor to receive the frequency data, it is often necessary to press ***PROGRAM.***

By pressing ***MANUAL*** your scanner will advance channel by channel through it's memory banks.

Scanners normally come with an antenna of some description and this is usually either a ***TELESCOPING WHIP*** or ***RUBBER DUCKIE.***

An external aerial can be employed to further enhance the reception.

The most common external antenna is a ***DISCONE***. This is a broadband aerial well suited to most listening applications.

If, however, you live outside built up areas or wish to monitor services well away from your location an ***ACTIVE ANTENNA*** may be the best for you.

An active antenna has a wideband ***RF*** (Radio Frequency) amplifier built into it. It can boost the incoming signal by as much as 20 dB (decibels) in gain. The higher the gain of the antenna the better the received signal.

A glance at most scanner handbooks will reveal words like ***SENSITIVITY*** and ***SELECTIVITY.***

Sensitivity is the minimum usable input required to activate the receiver. It is usually expressed as a decimal of a microvolt (0.2 microV or 1.0 microV) or similar.

The lower the figure the better the sensitivity.

Sensitivity is sometimes given with a reference, either ***S/N*** or ***SINAD***.

S/N is the ratio of signal to the background noise.

Sinad is the ratio of signal, noise and distortion.

Selectivity is the receivers ability to discriminate between closely located signals.

AUDIO OUTPUT is the power output of the speaker and this is usually given in watts or part of a watt.

As you become more familiar with your scanner, another term that may be encountered is ***IMAGE.***

An image is the receiver duplicating a false transmission on a frequency some distance from the genuine one.

To determine whether or not a received signal is an image or not, it is necessary to determine the ***IF*** or Intermediate Frequency of your receiver (the IF is sometimes given in the "Specifications" section of the handbook).

By doubling the IF then either adding or subtracting it from the suspect frequency you can easily check to see if it is an image or not.

While searching out new frequencies the scanner may stop on a frequency where no signal is present, just a humming noise. This noise is being generated from within the circuitry of the scanner and is known as a ***BIRDIE.***

To ascertain if a frequency is a birdie, simply remove the aerial. If the signal is still there, chances are it is a birdie. Little can be done to eliminate these annoying channels other than to "lock them out".

Strong signals can overload a scanner.

The result is a transmission that sounds like several people talking at once.

Some scanners have ***ATTENUATORS*** built into them and this function reduces the strength of the signal being fed to the receiver thereby cutting the overload.

It doesn't matter if you have a scanner worth $100 or $10,000, the principals are the same. Some have more memory, others have better built-in antennas or more powerful speakers, however, they all operate pretty much in the same way. These devices are to be used in a responsible manner.

Don't chase ambulances or hang around accident/fire scenes with your scanner blasting out the channel being used by the emergency services personnel.

All handheld and most mobile scanners have some method by which an ***EARPHONE*** can be connected, so you and you alone can overhear what is going on...use it!

A scanner can be an excellent travelling companion, alerting you to possible road dangers or delays up ahead.

A scanner can enhance your enjoyment of many things. Listening to aircraft involved in an airshow is one while another is listening to pit crew and crew to driver instructions at a motor race meeting.

Whatever your reason for having a scanner, CB Action welcomes you to an engrossing hobby.

This magazine regularly publishes reviews on new model scanners along with details on "secret" frequencies and other articles/reports on scanning in general.

We hope you enjoy Scanning and CB Action.

COMMUNICATIONS

12 - 16 Ferndell Street South Granville NSW 2142

Phone (02) 892 1400
Fax (02) 892 2308
Page (02) 962 8210

THE PROFESSIONAL COMMUNICATIONS CENTRE

CITIZENS BAND
Full Range of Quality Brands both 27MHz and 477MHz with after Sales Service. Expert Advice.

FREQUENCY REGISTERS by ESG
All Bands, All States... Latest Editions, call for Price and Order Form.

ANTENNA SYSTEMS
Full range of quality Antenna Systems, GME, RFI, ZCG, BENELEC, ICOM plus accessories, to get the best fitting and performance. Call for Price List and Order Form.

AMATEUR EQUIPMENT
From Icom, full Station operational. See your favourite equipment in operational environment

MAIL ORDER AND READER SERVICE
Call or Write to Oscar for our latest Price and Specials List. We will keep you up to date on new developments.

SCANNERS AND RECEIVERS
The latest Icom and other well known Brands

CODAN - HF Long Range Two Way
Sydney's biggest Codan Specialist

REPAIRS AND INSTALLATIONS

CELLULAR TELEPHONE, FAX AND ANSWERING MACHINES, ETC

OPENING HOURS
8.30am - 5.30pm
Mon - Fri
8am - 12 noon Sat
Or by appointment

We Recommend, Sell and Service the Products of:
- BENELEC
- ICOM
- Mobile One
- GME Electrophone
- Pearce Simpson
- Codan
- Uniden
- Imark / Kyodo
- ZCG Antenna
- Motorola
- NEC
- Canon
- RFI Antenna systems

GO DIRECTLY TO GAOL DO NOT PASS GO DO NOT COLLECT $200 (Penalty - $150,000)

This is the first time that I have actually written anything for this magazine although over the years I have commented on odds and ends to do with the Wireless Telegraphy Act and later the Radiocommunications Act of 1983, which replaced it. As a result of this I guess, I have been asked to give readers of CB Action an introduction to what awaits them with the passage into Law of the successor to those Acts, the Radiocommunications Act 1992. Many of you will have a quite different interest in Electronics to that of Amateur Radio Operators and therefore this article is written with an emphasis on CB operations, not Amateurs. If you wish to read my comments relating to Amateur Radio, I am sure the Editor will not mind my suggesting that you read my comments in this month's Amateur Radio Action magazine.

Historically it has been the intention of the Legislature to limit CB operations to certain specific channels in two bands of the Spectrum, namely, 27mhz and UHF. I use the term Channels deliberately because you do not need to look far to find people who are not happy with the designated channels and manufacture a channel or set of channels of their own. It is common to see both CB and Marine 27 MHZ equipment with such modifications, often in the form of an extra crystal that has been wired into the radio so that it can be switched in or out to access a whole new range of channels. My advice for anyone either CBer or Boatie, is to forget it and have the equipment modified back to original pronto. Why you ask? I will tell you.

How about imprisonment for up to two years or a fine of up to $150,000 for possession of such equipment? This is the penalty provided for by the RadioCommunications Act 1992, which received Royal Assent on the 11 Dec. 1992 but which will not take effect until the 1st July of this year.

"How about imprisonment for up to two years or a fine of up to $150,000 for possession of such equipment? This is the penalty provided for by the Radio Communications Act 1992, which received Royal Assent on the 11 Dec. 1992 but which will not take effect until the 1st July of this year."

The new Act represents an enormous leap forward in the Legislation pertaining to radiocommunications in this Country and at last represents an attempt by the Legislature to provide an up to date Act to close the loopholes that have frustrated prosecutions under all previous Acts.

I will give you a brief outline of a few only of the provisions of the New Act but will try to keep it simple and will not set out the wording of the Act but rather the effect of some of the Sections.

Just about everybody has heard that the first purpose of the Act is to establish a Spectrum Management Agency in place of the present Department of Transport and Communications which amongst other things has the obligation of dividing up the Radio frequency Spectrum into frequency bands in order to designate the various uses or users of those bands and thereby more effectively regulate communications. This division of the spectrum is to be preceded by draft plans about which the public may comment and make representations.

So far this does not seem to be much different from the present position where "the Department" does much the same thing in consultation with various National and International bodies.

However once these band plans have been established the SMA must also prepare and implement a marketing plan. Marketing means more effective utilisation of the spectrum for obtaining MONEY.

The important thing here is that the Act recognises the importance of what is called "public community services" (defined to cover such services as the CBRS) and the marketing plan may indicate how much of the spectrum is reserved

for such services. The word is "may", not "must". Obviously the stronger the body that makes representations on behalf of the Citizens Band service the better, because the more CB operators it can speak for the more influence it has.

Well what is the bottom line of what you can or can't do and what's all this fuss about gear that has been modified with afterburners, noise blanker switches which are anything but noise blankers, and which have become a poor example of the radio when first manufactured?

This Act sets out a scheme for licensing of all forms of RadioCommunications. That term is defined to mean radio emission OR reception of radio emission, for the purpose of communication between persons and persons, persons and things or things and things. This is to be achieved by the issuing of three types of licence, spectrum licences, apparatus licences and class licences.

You will note that whereas there has always previously been a distinction between transmission and reception, this Act now sets out to include reception in the same mould as transmission.

A radiocommunications device is defined to include transmitters and receivers.

A device means a transmitter or receiver and a non standard device is a device which does not comply with a standard or has been modified so that it no longer complies with the applicable standard. Thus you will see that Receivers and Transmitters may both be capable of being radiocommunications devices and are subject to the same embargoes as one another.

Let me take you through the Chapter headed "Unlicensed RadioCommunications".

The first no no is knowingly or recklessly operating a radiocommunications device that is not authorised by a spectrum or apparatus licence. If such a device is a transmitter operated by a person the penalties provide for imprisonment for up to two years. There is no provision for a fine.

If the offender is a Company the penalty is a fine of up to $150,000.

If the equipment used is not a transmitter the penalty is a fine of up to $2,000.

Putting the position very simply, after the 1st July of this year it will be an offence to operate a transmitter or receiver which is not authorised by an appropriate licence. The penalty for transmitting is mandatory imprisonment and for receiving, a fine. Yes I did say mandatory imprisonment.

There has been some disagreement about the scope of the power to prosecute under the Act of 1983, but there is no doubt under this Act.

Section 47 makes it an offence to have in one's possession, a receiver or transmitter for the purpose of operating, other than as authorised by an appropriate licence.

The penalties for possession of a transmitter are again mandatory imprisonment and in the case of a receiver, a fine of up to $2,000.

Under all previous types of legislation accused persons have been acquitted of offences related to use of unlicensed equipment where the Department was unable to prove that the offender was using the equipment at the time. It was necessary to actually catch them in the act so to speak and this made prosecution very very difficult. People avoided conviction where it was not possible to prove that the equipment was actually being used by the offender. This occurred even in some cases where the RI had tape recorded transmissions unless an expert could identify the voice as belonging to the person charged. It has always been hard to prove that one particular person was in possession of the equipment unless he was caught red handed.

"The penalty for transmitting is mandatory imprisonment and for receiving, a fine. Yes I did say mandatory imprisonment."

Well the SMA need not worry in the future. A device is to be regarded as being in one's possession for the purpose of operation if it can be operated merely by connecting it to the power, connecting a microphone, switching it on, switching on any other associated equipment, adjusting it's controls or connecting it to an antenna. It is to be treated as under one's control even if it is in the possession of someone else. What this means is that the Prosecuting authorities will not have to prove an intention to use the equipment nor that it was used. All that will be necessary to prove is that it was able to be used by the addition of any of the steps I have set out above.

Do you own a power mike or do you run more power than your 5 watts? Let me explain in the most simple and non technical way how a power mike works and how it's use can lead to some expensive problems for you.

When a manufacturer makes a radio he designs it so that each part works with the next part to produce the finished result. For instance the radio is designed to operate over a particular range of frequencies but is also designed so that the microphone fits the radio or putting it a little more technically, drives the radio to it's correct power.

A power mike, increases the output from the microphone which means that the audio stages of the radio are receiving more signal from the microphone than they need.

This may make your sound "louder" mainly because the mike picks up a lot more noise from the room but it does not make the radio put out any more power. If it did so, the radio would be illegal but it is not possible for a radio to transmit more than 100 % of it's power. In SSB use, the most likely result of using a power mike is INTERFERENCE because the excess gain of the mike will cause the radio to splatter, that is, put out signal beyond the bandwidth of the channel on which you are transmitting.

The other add on that I should mention is the Linear Amplifier. This is a device that is placed between the radio and the antenna which amplifies the signal from the radio and increases its power. CB radios are only licensed for 5 watts, or the SSB equivalent and the use of a linear is simply put, illegal. It also increases the risk of your signal causing interference to your neighbours.

This can take the form of upsetting their television picture or sound, their Stereo, even their telephone. In the past interference has been a problem which has not caused a person to end up in Court except perhaps where he has been charged for breaching the Regulations through excess power or the like.

However in a nutshell, access may now be had to the Courts for an injunction to restrain the use of your station and for damages or financial compensation.

continued over page...

GO DIRECTLY TO GAOL DO NOT PASS GO DO NOT COLLECT $200 (Penalty $150,000)

Continued from previous page...

The saving grace here is that such a remedy is not available where the equipment is used in accordance with its licence. In the past equipment which caused interference could be put off the air but it would have been extremely hard to sue for any loss or damage caused by it's use. This legislation makes suing relatively easy.

I wish to emphasise that this opportunity only arises when equipment is used outside the terms of it's licence. If you buy your type approved CB without modifications and use it as it was intended this part of the Act need not concern you.

I have placed much emphasis on the problems of using or possessing equipment which has been modified, but it is important to remember that the same comments relate to equipment which was never intended for CB use which is modified for use by CB operators and Transmitters which are modified for general coverage use over a variety of bands or channels, as for instance, Marine Band and 27 MHZ CB, or UHF Commercial and CB equipment.

It is worth noting therefore that there is specific provision made for an offence of operating equipment which has been modified. This offence carries a penalty of up to $12,000 and applies even if the equipment is being actually used within the parameters for which it is licensed. Thus this Act makes it an offence to operate for any purpose (except in an emergency) any equipment which is non standard within the definition that I summarised earlier.

The Act also specifically provides for an offence of supplying such modified equipment, the penalty for which is a fine of up to $12,000.

I should add that whenever a person is convicted of any offence against the Act the Court has the power to order the forfeiture of anything used in the commission of the offence.

" Anything" does not just mean the transmitter or receiver but could include motor vehicles, towers, antennas and the like that are actually used by the Defendant to enable him to commit the offence. There is similar Legislation in the United States regarding things used in relation to the drug trade. It is now quite common for even houses to be seized under that Legislation in serious cases. Most Australian States and several Commonwealth Acts have provisions for confiscation of equipment used to facilitate the commission of serious crimes.

Depending on the degree to which say, a car was used and the seriousness of the breach of the Act, I would not be surprised to find Courts ordering the confiscation of say, a vehicle used to make illegal jamming of Security or Police transmissions, whereby detection and apprehension was made more difficult. Do not be surprised to hear that people convicted of modifying equipment lose their test gear used in the modification.

"If a customer makes a false statement about his eligibility for such a licence or a dealer makes any false statement there is a fine of up to $10,000."

A question which often arises is whether a dealer needs to view a licence before selling CB or other transmitting equipment.

Section 301 of the Act requires dealers from the 1st July to view the licence before selling any Radiocommunications device (that means receiver or transmitter) and to retain all particulars of sale for at least two years. The penalty for a breach of this Section is a fine of up to $2,000.

If a customer makes a false statement about his eligibility for such a licence or a dealer makes any false statement there is a fine of up to $10,000.

I am told that some time ago there was a problem in Victoria when a dealer tried to enforce the rule of "no licence, no sale".

Once the 1st July comes around none of us should expect to be able to buy any Radiocommunication device without proof that we have a licence that authorises us to have it. Remember that this rule applies equally to receivers as it does to transmitters.

This provision is meant to ensure that all operators are licensed and that there is a way of identifying the people who have transmitting or receiving equipment. I wonder how many CB operators there are who have never obtained a licence? Beware, or better still, get a licence before July 1st.

Before you ask how this can apply, say to broadcast band "trannies"or to our "tellies" the answer would seem to be in the power that the SMA has to specify which receivers are to be included and which are to excluded, in the Regulations to be made under the Act.

Whilst Government Policy continues to permit of no radio licence for such gear, they will be exempt. How many of you remember that it is not so long ago that we had to have a licence for our domestic radio and television? How many of you still have your old combined radio and television licence?

Just to explain this a little more, I will put it this way. The Act, or for that matter any Act, becomes Law when it is passed by the Parliament and assented to by the Governor-General. Most Acts do not want to be bothered with trivia such as the odds and ends which may frequently need to be changed.

It is difficult enough to get politicians to agree on major things without having to put every little change through the Parliament. I mean, if that was the case we would need full time pollies just to deal with whether a sign post was to be one size or another.

In order to permit easy changes to be made, we have subordinate legislation or

Regulations. In the case of this Act, the Regulations permit the Agency to set out lists of transmitters or receivers which are approved and of course to amend that list as new equipment comes out or for any other reason.

I expect that those Regulations will exclude Broadcast equipment used for Audio or Video reception for which no licence is required. It is in relation to equipment for which a licence is required that the seller will have the obligation to view the licence.

Have you ever been walking down the street and come across a vehicle bedecked with sixteen antennas, a dash full of every conceivable type of radio, having twenty four microphones wrapped around the steering column, with twin air horns on the roof rack between the antennas and wondered at the ownership of this mobile shack?

The new Act envisages that the SMA will issue identification stickers to place on all equipment be it mobile or base station setting out such information as the Agency requires.

Apparently this idea was tried a few years ago in some parts of Australia to see whether or not it was capable of working satisfactorily on a larger scale and was found to be worthwhile.

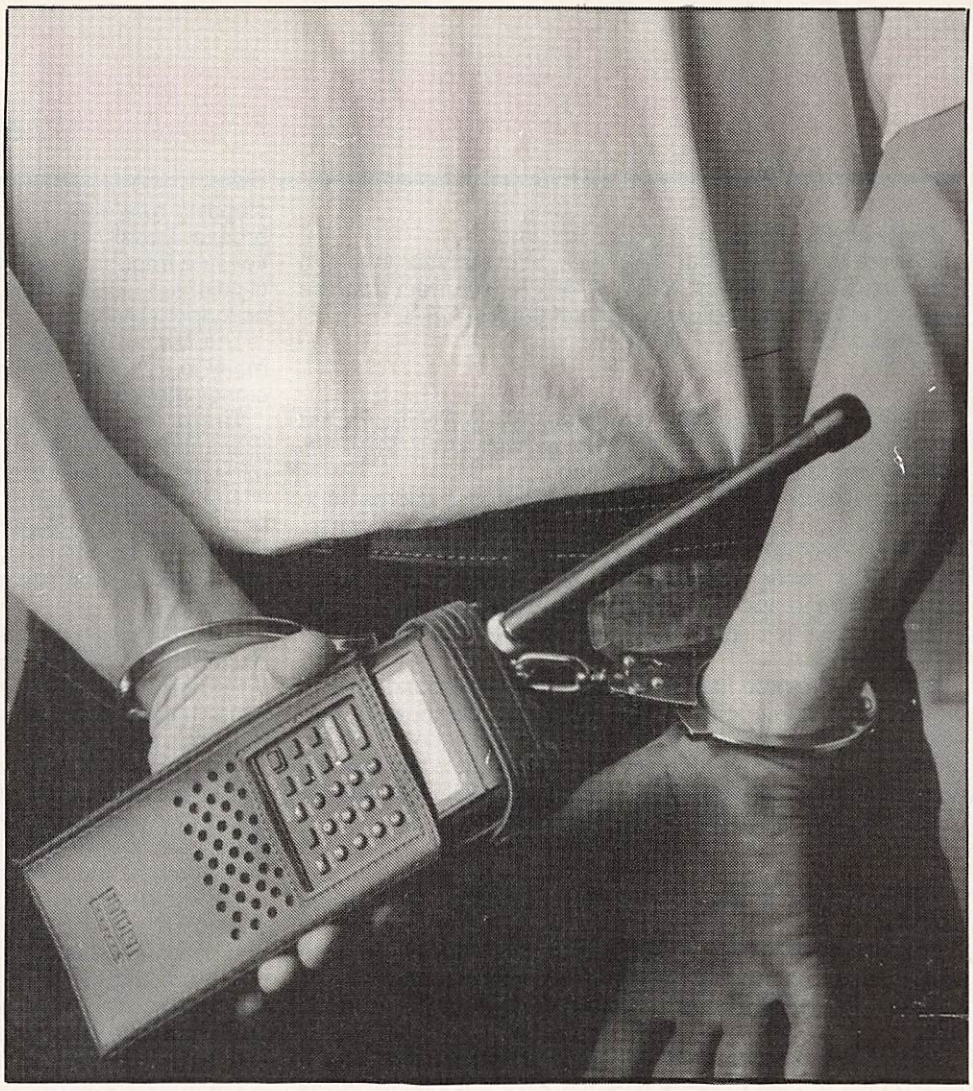
Perhaps it will not be long before all gear is fitted with a digitally encoded label so that if it is stolen and used it's identity can be traced.

To many people this legislation will seem harsh and draconian and well it might be.

However the Law follows changes in society and the attitudes of society.In the same way that we now have breathalyzer limits of .05 in most parts of Australia (which most of us would find harsh) whereas we had no limit until the mid sixties, people's attitudes and changes in understanding of the effects of alcohol on people forced the Law to adapt.

This Act is a very complex piece of Legislation which will allow the Government to overcome previous difficulties in applying a sense of discipline to the possession and use of transmitters and receivers and may help to ensure that we do not have any future Kennett tapes or Fergie tapes .

It has a number of very positive features to it which should assist the genuine CB operator to enjoy his or her hobby more than before.



We're not suggesting for a minute that you will go to gaol for owning/using a scanner, BUT, under the new Act anything may become possible at some time in the not too distant future.

It does not suggest that there will be any increased restriction on the use of CB equipment for its intended purpose.

What it will do however is make it easier to determine the identity of the cowboys who give the hobby a bad name, and show who is and is not licenced.

In this age of user pays, it is worth remembering that your parts of the operating spectrum can be worth a lot of money to Commercial concerns.

Governments are interested in making the User pay.

The more licensed users, the less they should have to pay. Conversely, the less people that pay, the weaker the argument for retaining your parts of the spectrum.

My advice then is if you are not licensed, become licensed, if you have modified or non approved equipment, get rid of it or have it unmodified by 1st July.

As an amateur operator one of the greatest thrills I have had, is communicating on morse code with a Student in the hills of Korea, on his small packset, and relaying to his father in the United States, that his son was well.

The letter that I received from him on his return to the U.S. was a visible reminder of what 500 milliwatts and a couple of torch batteries can achieve.

I suppose today he would have a portable satellite system and hook into AT&T whenever he wished.

Ah well, perhaps that is the price of progress!

I hope that you find some benefit from this article and I look forward to commenting further should the occasion arise, on matters of interest to the Citizens Band Radio Service.

Bandspread

BY GREG TOWELLS

CORRECT ADDRESS

Just a small correction to the last column.

To write to me with your feedback, address your letters to P.O. Box 577, St Marys, NSW, 2760. An incorrect address featured in the Contributors column of the last CBA.

Sorry about that.

STRANGE NOISES ON 27 MHz

Continuing from last time, the pirate South Pacific Packet net has been noted on 27.505 Mhz as well as 27.540 Mhz, possibly operating a dual port system.

Seems like 27 Mhz is a playground for those interested in digital communications, but lacking an amateur radio license. An AMTOR/SITOR station has been operating for a while on 26.995 Mhz, recognisable by the "chirp chirp" sound. There is also a spread spectrum station operating between 26.860 to 26.960 Mhz in 5 Khz steps, moving every 1/4 second. An interesting one.

High speed morse has been heard as well, around 15wpm on 27.138 Mhz, and it sounded as if it were computer generated, particularly since the PK-232 could decode it with no problems. I would be interested to hear what other readers have copied using equipment such as PK-232's on the 27 Mhz area. Thanks to Ash for the above info.

NEW YUPITERU SCANNER

Yupiteru have released yet another model of handheld scanner.

Called the MVT-7100, it supersedes the 7000, in fact the performance of the 7100 makes the previous unit look a little ill. It is slightly smaller than the 7000 with more rounded lines.

The 7100 has all the features of the previous model and is very similar to operate, very user friendly, to my mind, unlike my own scanner which requires the handbook to be handy whenever I want to do anything different.

The frequency range has been extended to 100 Khz to 1650 Mhz, with sensitivity, selectivity and image rejection dramatically improved.

To illustrate the improvement in receiver specs, I test ran the radio in a location which is very much an RF cage, a deadspot for reception.

Additionally this location has around 20 dirty computers almost overhead, not a nice place to listen to a radio. The radio surprised all who were present.

Signals that are normally noisy in this environment came in perfectly clear, and numerous new stations were able to be copied. I monitored stations all over the spectrum available and signals came in clearly everywhere.

There was virtually no breakthrough from the nearby pager transmitters and few spikes and noise from the computers situated above.

Reception below 30 Mhz is a surprise. The radio, with only the supplied extendable antenna, received a lot of local and overseas stations on the recognised shortwave bands, and local AM broadcast stations came in very well.

The radio performed just as well as radios designed solely for reception below 30 Mhz.

Included in the reception modes is SSB, and considering the excellent performance below 30 Mhz, tuning for SSB stations became a lot of fun and very easy. The smallest stepping rate is 50 Hz, which makes tuning SSB stations a breeze. It really is a buzz to hold a SCANNER in your hand, key in a frequency on 14 Mhz and listen to amateur communications on USB clearly from around the world, and this on an indoor antenna.

The MVT-7100 has a host of great features, probably too many to try to list here, but I will go through some of the outstanding ones.

There are 1000 memory channels, which can be programmed with all the usual information, including programming any channel to have the attenuator on or off.

That's right, electronic control over the attenuator, so if you have overload problems with any frequency programmed in, just include the attenuator on when you program in the channel. Any 500 channels can be locked out in either search or scan mode.

The radio has a nine bar signal meter so you can SEE how much better signals come in.

Reception on WFM is marvellous. Program in FM broadcast stations and throw away your walkman because this radio has great audio.

Included in the scan modes is one called M-SCAN. With this is activated the radio will only scan channels with the same mode as the VFO. For example SSB or FM-n scan. It also has a MONITOR button, positioned where a PTT switch might be on a transceiver.

If the signal you are listening to disappears below the squelch level, just push this switch to override the squelch and continue listening to the signal.

Overall, a great scanner and a big improvement over the previous model, which was already a good performer. The SSB reception was great and operation below 30 Mhz was just as good as a HF communications receiver.

The radio would shine with an external antenna. The MVT-7100 is available from Andrews Communications for $749, and thanks to Tony and Andrews Communications for the review of the radio.

CITIZENS BAND PACKET RADIO SERVICE

A proposal has been put forward recently regarding an extension to the presently available CB radio service.

That is, allocating a number of channels, either new frequencies or existing ones to be used exclusively for a Citizens Band Packet Radio Service.

This service would cater for non-amateurs with an interest in radios and computers to expand their interest to combine both devices and further their enthusiasm and knowledge of both.

Radio in general has been losing technically interested young people in favour of computer technology, and the introduction of this proposal would do a lot to entice users with their computers to radio.

Further, after trying out packet on radio, these same people may gain the experience and knowledge necessary to upgrade to the unlimited horizons available with amateur radio.

Packet on CB would give a lot of people the opportunity to play with and experience the fascination of packet radio not otherwise available with CB, and act as a stepping stone to the proposed no-code amateur license.

Drawing more interested people into radio must be a good thing after all.

Right then, down to some detail.

AND THE DETAILS ARE...

Since this proposal was first mooted on the Aus. Radio Conference on phone BBSs by Peter Berrett, how about some of his suggestions.

Peter suggests allocating approximately 80 channels within the existing 70 cm amateur band, an idea sure to generate protests from many licensed amateurs.

Peter is a licensed amateur, VK3KAT, and I support his argument that within a very short time after the introduction of such a service, that there would be many thousands of computer users operating in the band - many more than if it were to remain purely amateur.

I would suggest that having a CB packet radio service within an existing amateur band, but not a part of the amateur network, would enable the expertise of amateurs to assist CB packeteers to pick up knowledge and expertise in the operation of the medium, generating new recruits to the amateur service along the way.

Additionally, the expanded number of users would do much to ensure that commercial users do not manage to acquire parts of the 70 cm band for themselves.

MAYBE ON CB UHF

If 80 channels within the 70 cm band is impractical, then possibly allocating a few channels with the existing UHF CB band or immediately adjacent to that band might be the way to go.

Unlike voice, a number of packet stations can share the same channel, admittedly with reduced throughput, but each need not know that the others are there.

An argument that has arisen has concerned whether CB packet operators would bother to establish packet BBS's and digipeaters as exist within the amateur service. You only need to look at the number of UHF CB repeaters that have arisen since the start of that service.

remember the arguments then that no-one would pour money into establishing a free CB repeater for use by the masses. How time has proven that theory wrong, with hundreds of repeaters operational around the country.

CB PACKET BBS EASY TO SET UP

CB packet bulletin boards would be easier to set up, since suitable software is available, and as I reported in the last column, there is already a pirate packet bulletin board network operating, so what is stopping the general public from setting up their own packet bbs's. Also many private computer enthusiasts set up phone bbs's for free general use, why not on radio??

Probably the biggest obstacle to the proposal might be type of approved equipment and the supply of such.

If the packet service were to be located within either existing amateur or UHF CB bands then the appropriate brands and models of equipment could be certified as being suitable for CB packet radio use.

TNCs for packet only use could also be type approved for CB use, outlawing the use of multi-mode type TNCs within the CB packet service.

As users of a CB packet service felt like upgrading their scope of operation, the experience gained through the establishment of a packet radio station should make the upgrading to amateur license easier and fun.

There is also a suggestion that phone BBSs may be able to hook up their messaging facilities to a CB packet radio service.

I think that this idea would not be a good idea. The amount of mail flowing through the service from phone BBSs would quickly clog up the frequencies available to a CB packet service and bring it to a stop very quickly.

The amateur packet radio service enables large quantities of mail to move only by the use of many frequencies dedicated to mail movement, both on UHF and HF links.

I expect a lot of responses to this proposal of packet on CB.

Remember it is only a proposal, and cast your memories back some 20 years when Citizens Band radio was first proposed in Australia.

Lots of comment and protest both for and against. Hopefully this proposal will generate some thought and maybe lots of other ideas for the future of CB radio.

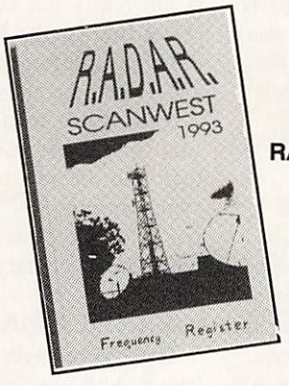
Another comment on the Packet proposal was: "If the amateur community wishes to be involved, it would be far better if it offered a `guiding hand' than outright objection.

The former offers an opportunity, the latter, total loss of control.

There are numerous possibilities...perhaps the amateur community as a whole can provide encouragement in lieu of the `class stratification' we've come to expect these days.

You want more licensed amateurs, you gotta go and get 'em by making it worthwhile technically and socially."

It's back to you the reader, what do you think??



R.A.D.A.R.

RADIO FREQUENCY REGISTERS

Box 297 Cloverdale WA 6105

Phone (09) 377 3049

"OUT NOW"

1993

SCANWEST

R.R.P. $32.95

in ~`A5' Alpha-User Listing

Contains DoTaC, CAA and other Authorised frequency listings for the following:

(LF-MF-HF-VHF-UHF)

(200KHz - 1745MHz inclusive)

available at these outlets

WACB Centre (09) 328 6254 ◆ ALLCOM/Radio One (09) 479 4997 ◆ Altronics (09) 328 2199 ◆ Avon T.V.Services (096) 22 2343 ◆ Midland CB (09) 274 5750 ◆T.V.Joes (09) 527 1806 ◆ Mandurah TV & Hi-Fi (09) 581 2206 ◆ Collie Electronics (097) 34 1220 ◆ Micro Electronics (097) 21 6222 ◆ Todays Electronics (090) 21 5212 ◆ XJ Electronics (09) 295 3333 and Cash Converters at: City, Armadale, Midland, Morley, Mandorah, Rockingham, Bunbury, Wangara and all Gardner Electronics stores (W.A.)

One more time....

IT'S SWR TIME (AGAIN) BUT THIS TIME WITH A DIFFERENCE

BY KEN REYNOLDS

In the early days of CB in Australia, SWR meters used to be `big sellers' and their use was more widely understood than today. Could it be that in a world full of off-the-shelf pre-tuned antennas the need for do-it-yourself SWERing has become a thing of the past?

Could it be that thousands of CB users are driving around unaware that their antenna needs to be tuned and someone didn't tell them?

Hmmmm.

But who would do that Chuckie?

SWR, SWER OR SWERVING

Somehow we always seem to get back to SWR or SWeR or SWeRving or whatever you like to call it. No matter, however, what you call it, we all know it has got something to do with tuning the antenna.

So, instead of breaking the same old ground for the umpteenth time, let's take a more radical look at the subject and readers will soon realise that if they understand what we are trying to evaluate with the SWR meter, all the rest will soon fall into place.

THE PROBLEM IS SIMPLE

The problem is simple, it's the electronic theory behind solution that complicates the issue.

So, let's dispense with the math and resolve the problem to its simplest terms.....because, all you need to do is tune the antenna, for the most part, who cares why it works.

The quest is to move efficiently a value of power from one place to another with as little loss as possible along the way, and then have it consumed with minimum `left-overs'. The power source is the CB transmitter, the transmission line (co-axial cable) provides the route and the antenna is the load or receptor where the power is to be delivered.

What happens to power after it arrives is not really our concern here - we will leave that in the hands of the antenna designers. Our only concern is to produce and deliver the power.

Now, if you are using a CB radio for the first time it may not be patently obvious that your antenna needs tuning. The only symptom might be a feeling that the system is not functioning properly when you fail to make contact with any other operator.

RECEIVER MAY SOUND `DEAD'

The CB receiver may also sound a bit `dead' with only occasional signals being heard. This can be because power received by the antenna is also not being efficiently conveyed to the receiver.

A `mismatched' antenna also effects receiver performance in much the same way as the transmitter, but in reverse.

The term SWR is an anagram for Standing Wave Ratio which, believe it or not, has very little to do with our problem.

Who cares about standing waves as such...they are simply a product of the moving waves we want to send to the antenna.

If we do this efficiently we know the antenna will accept this power and radiate it to its final destination. \

Therefore, we will have virtually no residual or `left-over' power and negligible standing waves.

POWER DOESN'T JUST DISAPPEAR

Logic (I hope) tells us that any residual power doesn't just disappear, it always has to go somewhere and it usually takes the obvious path and heads back down the cable toward the source.

We now have two currents flowing in the cable.

The primary or FORWARD current travelling to the load (antenna) and a secondary REFLECTED current travelling from the load back toward the transmitter.

Both currents are proportional to the driving force - full power from the transmitter and a reduced level of left-over power not consumed by the antenna travelling in the opposite direction.

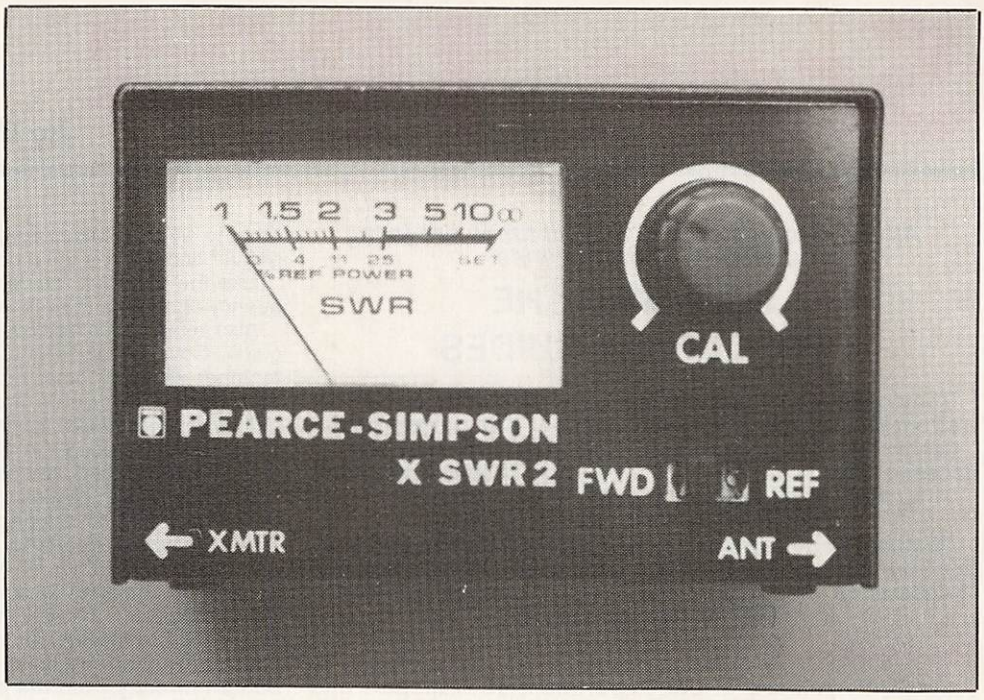
At certain points along the length of the transmission line (depending on the electrical wavelength) the power from the conflicting currents will produce `lumps' of power where their forces are in harmony (in phase) and quiet `pools' or nodes where the forces cancel.

THE LEGENDARY STANDING WAVES

These lumps are the legendary Standing Waves which appear to be stationary along the cable and they are a function of the wavelength of the signal and the length of the line.

For example, if we change the wavelength of the signal by changing its frequency, or, change the length of the transmission line, the time relationship between the two is broken and the position of the standing waves will shift accordingly.

This SWR meter costs around $39 and could save you a lot of grief.



CLEAR AS MUD? DON'T WORRY

If this paragraph is as clear as mud don't worry because you don't need to fully grasp it to understand the following.

A high SWR is bit like having high blood pressure; you may not have any obvious symptoms but you should have a check now and again because the results can be very dangerous - to your radio in the former case, to your life in the latter case.

Since this whole SWR process is invisible to the operator (who may not notice any trouble symptoms) we need a way to evaluate the situation.

ENTER THE SWR METER.

I don't know why the little budget priced instrument was ever named an SWR meter because it doesn't measure standing waves at all. It measures moving waves.

There are other names applied to these instruments, like Reflectometer and Directional Coupler and these two terms more accurately describe its functions.

After all, we really want to know how much power is being returned back down the cable from the antenna (unused power) and its relationship to the power being transmitted to the antenna.

If we consider the transmitter output power as 100 per cent, or our reference level, and relate this value to the residual power being returned to the transmitter, we can easily calculate the level of efficiency of power delivery to the antenna load.

YOU DON'T NEEDS MATHS

You really don't even need maths to decide if most of the power is being delivered or wasted.

The more power returned to the transmitter the greater the SWR and the lower the efficiency of power transfer.

Obviously, we are chasing the lowest `reflected' or returned power reading showing us that almost all the power is being consumed by the antenna.

A directional coupler usually consists of a section of transmission line assembled in a way that allows directional reading sensors to be fitted within the cavity.

These sensors are coupled to a metering circuit in simple instruments or in the case of our laboratory coupler (shown in the photograph) the output is connected to a spectrum analyser and tracking generator which produce `swept' measurements of whole chunks of the radio spectrum - up to 1,000MHz in one sweep.

The FORWARD sensor taps-off a small quantity of power flowing toward the antenna and applies it to the meter where its level can be displayed.

The REFLECTED sensor detects any power that might be travelling in the opposite direction and similarly routes it to the meter for comparison.

METER IS CHEAP IS BUY

The instrument shown here is cheap to buy and is more than adequate for tuning 27MHz antennas.

Its limited frequency response makes it unsuitable for use at UHF where much more accurate, expensive instruments can lead the inexperienced into more trouble than enough by offering all types of misleading readings.

To operate the meter it must first be inserted into the transmission line using a short `patch' lead of the same impedance cable.

The meter is usually located close to the transmitter for convenience but it could also be connected immediately below the antenna.

IT REALLY DOESN'T MATTER

There is some argument about the correct placing of the instrument, however, armed with the correct information it really doesn't matter which point you select.

Having connected the instrument in circuit and checked that the connectors are secured, we now need to calibrate the meter so that the forward going power is set to full scale reading on the meter.

USE AM NOT SSB

Switch your CB to AM - rather than sideband because we need a steady signal to take the readings - and set the meter switch to FWD or CAL as the case may be.

The terminology varies from meter to meter but the meaning is the same.

Press the PTT (push to talk) button and adjust the calibrate control until the meter needle corresponds with the CAL or SET mark on the right hand side of the meter scale.

While holding the PTT button depressed, set the meter function switch to REV or REF or SWR (whatever the case) to read the reflected power being returned from the load.

If the needle `drops' to a low reading on the scale you can relax.

UPPER AND LOWER BAND READINGS

Take readings at the upper and lower ends of the band.

If you get low readings at channels 1 and 40, smile and think of something else to do.

If the needle reads more than 1.5 on the scale you might spend a bit of time adjusting it for a better reading.

If the needle is `up-in-the-red', rummage through your old CB Actions for one of the dozen or so pieces on how to tune your antenna.

And, oh....good luck.

Scan 1993

By Russell Bryant

All frequencies are FM and all times are local, unless stated otherwise.

SCANNING THE FREQUENCY GUIDES

They cover every state in the Commonwealth, as well as aircraft, railways, emergency services and government users. They are probably the largest selling, after sales accessory for scanners in this country. They are the many and varied frequency guides and registers.
I decided to investigate the market.
Walk into any radio or electronics hobby shop and you are bound to come across a myriad of books detailing the frequencies used by just about every licensed communications user on record.

TEN YEARS AGO

Since the release of the Department of Transport and Communications computer records a decade ago, the industry that has developed around the compiling, printing and distribution of the information, has been a blessing to the scanner user.

When first available, the DoTaC records were supplied on microfiche slides, costing $20 a set. This required a microfiche reader in order to procure the data contained on nearly 100 slides. At around $400 they are not cheap.

The alternative entailed many hours occupying a chair in your local library busily sorting through thousands of individual users and frequencies to locate those of interest.

Four or five years ago DoTaC, in an attempt to curb the losses associated with the microfiche slides, switched to computer discs, at a significant increase in price to the public, (about $180 a set).

FROM RAW TO READABLE

With the average price of a frequency guide being around $30, it is easy to see why they are popular, not only for price, but because all the hard work of sorting and correlating the raw data has been done for you. The result is an easy to read, usually well laid reference source. With new and different guides appearing on the market, almost continuously, now would be a good time to check out what registers and guides are available, what they offer the user, where they can be bought, and more importantly, what they cost. The products are divided into two groups, General Frequency Guides and Specific Users Registers.

GENTLEMEN, START YOUR SCANNERS

This is not a review as such, I will not be offering any opinion on the accuracy, merit or value for money of any of the books listed. Computer records are not included in this overview, as they are of limited appeal to the average scanner enthusiast.

I suppose that it is only fitting that I start with the elder statesman of frequency guides, ESG.

GENERAL FREQUENCY GUIDES

ESG,

GPO Box 1200 Adelaide SA 5001.

Produced by ESG.

Approximately A5 size, loose leaf sheets, bound in a ring folder. Covering all Australian states. Updated annually.

The general guides cover the frequencies 32 to 860 MHz inclusive, where the power output is five watts or greater and the registered use is voice. They are available in two formats, sorted by frequency or by user name. Price varies from $27.50 to $32.50.

The Australian HF Register lists licensed users in the band 1.7 MHz to 26.785 MHz, again where the power is five watts or greater and voice is the modulation mode.

Like the VHF/UHF guides the HF version comes sorted by frequency or name and sells for $42.50.

Also retailing for $42.50 is the Australian Emergency Services guide. Covering all rescue, fire, police and ambulance services, together with any other organisation likely to be involved in an emergency, the guide includes a section on HF as well as VHF/UHF allocations. For those who require the overall picture, ESG have produced the Complete Frequency Registers listing every frequency and user between 27 MHz and 2000 MHz.

All transmission modes, power outputs and transmission types are contained within the pages of the Complete guides.

The Complete Frequency Registers sell for $25 for the ACT version, up to $132.50 for NSW. Finally for the enthusiast that needs to know all about his local police force, ESG have the Australian Police Register. For $32, the guide details all frequency allocations made to the various state and federal police departments, including, marine, aircraft and link frequencies. **ESG can be bought directly from the publisher, or from any of the following stores, Jensens Electronics, Prospect, SA, South Pacific Radio, Kalangur,QLD.**

THE SCANNER FANATICS FREQUENCY REGISTERS.

PO Box 1352 Narrewarren VIC 3805.

Produced by Tamara Graphics and Printing.

A4 size, saddle stitch binding, soft cover.

New edition produced every year. The Fanatics guides feature general commercial users as well as specific details on the emergency services. All states are represented, with the South Australian and Northern Territory combined in one publication. The Scanner Fanatics Registers are compiled from the Public Access Radio Registers released under the Freedom of Information Act, via the Department of Transport and Communications.Sorting for the General users between 20 MHz and 1300 MHz is by frequency. Police are covered with not only frequencies, but also districts, maps, codes and callsigns. Ambulance and fire services also receive special attention.

The Scanner Fanatics Frequency Registers are available from the above address, or from Time Plus, Brunswick, VIC, Just Communications, Mitcham, VIC, Power Band Communications, Cheltenham, VIC, or any Dick Smith Electronics store Australia wide. All guides are priced at $25.

SCANWEST.

PO Box 297 Cloverdale WA 6105.

Produced by RADAA.

A4 size, staple binding, soft cover. Updated every six months, (January and June). The DoTaC PARR releases form the base for the SCANWEST registers. Frequency allocations covered are from 25 MHz to 1500 MHz, currently SCANWEST sort the data by frequency order. However alphabetical directories are planned for release this year. Located throughout the guide are information pages listing callsigns, radio codes and other relevant information on police, fire, ambulance and broadcast services.

As well as the aforementioned alphabetical guides, SCANWEST will be distributing registers for all Australian states in 1993. The retail price for the Western Australian edition is $40. I have no details as to the pricing structure of future releases.

The SCANWEST Radio Frequency Registers are sold through the WA CB Centre, West Perth, WA, Midland CB, Mid Vale, WA, Cash Converters all WA stores, Radio One Comms, Belmont, WA, Mandurah TV and HiFi, Mandurah, WA, Collie Electronics, Collie, WA, Micro Electronics Bunbury, WA, Todays Electronics, Kalgoorlie, WA, TV Joes, Rockingham, WA, Altronics, Northbridge, WA or direct from the publisher.

Continued over page

THE TOURISTS FREQUENCY LIST.

PO Box 246 Glen Waverley VIC 3150.

Produced by S.S.S Services.

Smaller than A4 size, spiral bound, soft cover. Assembled from various sources including DoTaC, publishers records and informed third parties. Frequency coverage encompasses users from HF to 800 MHz for Victoria only.

A departure from the usual listing, the Tourist's List divides the state into numerous geographic and administrative areas. Designated Central, Gippsland, North Central, North East, North West, South West, Western Victoria and Victoria Wide, the material is alphabetically tabulated.

Adjunct to the general lists are regional summary pages, detailing the exact frequencies used by the ambulance, fire, police, rail and aircraft relative to the area. Link frequencies are located at the end of each section, highlighted in blue.

En Route frequencies for the major Victoria Highways form another section of the book.

The first and only Tourist's Frequency List I know of, is dated April 1992. I am unaware if subsequent editions have been released. I have no information as to price either.

THE ULTIMATE SCANNER FREQUENCY REGISTER.

PO Box 624 Hawthorn VIC 3122.

Produced by Talkback Systems Australia.

A4 format, staple binding, soft cover.

The Ultimate Registers are updated from time to time, no exact calender is given.

Again the basis of the Ultimate Register is the DoTaC public information records, assisted by, `local knowledge and the marvellous efforts from fellow scanner radio listeners'. Covering 30 MHz to 1000 MHz, the guide lists the facts in alphabetical order. Any user with a radiated power level below five watts has been deleted from the register.

As a prelude to the common licencees, several pages are devoted to the emergency services, including callsigns, codes and commonly used terminology. **As of February 1993, Registers for other states are available from Talkback Systems. Recommended retail is $40 a copy from the above address or over the counter at Time Plus Pty Ltd, Brunswick, VIC.**

Another source is the Spectrum Bulletin Board, telephone 03 819 9167. Have your credit card details at the ready.

SPECIAL PURPOSE GUIDES

VISOR-CODE.

PO Box 202 Melton VIC 3337.

Produced by ScanBank Australia.

Updated as and when required.

While not frequency registers in the usual sense of the word, these 31cm by 11 cm plastic coated cards are designed to be affixed to the sun visor of your car.

Presently only the Victoria Police and Victoria Fire Services are covered by Visor-Code.

In the case of the police card, the obverse highlights the UHF allocations, police stations, frequencies covering the major highways and special operations channels.

The reverse carries all VHF channels and where they are used. Radio codes and callsigns are also included. The fire Visor-code supports frequencies, stations and numbers, appliances and codes for the Melbourne Metropolitan Fire Brigade as well as the Country Fire Authority. **Both cards are available from ScanBank Australia at the address given, or from radio and electronics stores throughout Victoria, including PowerBand, Cheltenham, VIC and Just Communications, Mitcham, VIC. Retail price is around $10.**

REGISTER OF GOVERNMENT RADIO FREQUENCIES.

33-35 Alleyne St Chatswood NSW 2067.

Produced by Access Communications.

A4, saddle stitch binding, soft cover. Updated regularly. The radio spectrum can be split into two distinct groups, government and non government users.

By far the most interesting transmissions radiate from government radios.

The focal point of this publication is to provide frequency information, codes and callsigns for government and semi government instrumentalities for NSW, ACT, Victoria, Federal and Defence Departments, as well as associated services, such as marine and aircraft.

Format varies depending on the service, channel numbers and frequency order are the predominate styles employed. Departments and services are listed alphabetically.

The Register of Government Radio Frequencies can be obtained from any Dick Smith Electronics store, or from Phonetronics stores. Price is roughly $25.

EMERGENCY AND ESSENTIAL SERVICES REFERENCE LIST.

PO Box 728 Charlestown NSW 2290.

Produced by the Newcastle District Scanner Group.

A4 size, stapled, paper covers.

Basically an `in-house' publication, the Reference List pays specific attention to services within the Newcastle, Central Coast and Hunter Valley areas. Codes, callsigns and frequencies of government, emergency and essential services, are the basis of the guide.

As an interesting sidelight, security, towing, bus, taxi and hire car services are also included. Aircraft and marine band allocations receive attention. **The Emergency and Essential Service Reference List is only available from the Newcastle District Scanner Group. Pricing details are not available.**

LISTENING IN TO AIRCRAFT RADIO.

PO Box 16 Georges Hall NSW 2198.

Produced by Airband Communications. A4, saddle stitch binding, soft cover. Sequel to the Australian Airband Guide. Author Bob Bell is acknowledged as this country's leading authority on aircraft communications. All aspects of aircraft radio are covered, including HF, VHF, UHF and satellite comms. The narrative provides an overall picture of all aspects associated with aircraft. Military and international radio is covered in chapters directed to those who chase aircraft around the world. A large glossary of aeronautical and radio terminology takes some of the mystique away from the language associated with planes and communications. **Airband Communications provide a mail order service from the above address. Many aero shops stock the book, as does Dick Smith Electronics stores throughout Australia. Priced at $22.95.**

AUSTRALIAN MARITIME RADIO.

PO Box 16 Georges Hall NSW 2198.

Produced by Airband Communications. Smaller than A4, saddle stitch binding, soft cover. Suitable for the seasoned boatie, or the interested marine radio monitor.

This book features a review of HF, 27 MHZ, VHF and UHF maritime radio. Seaphone, Radphone and IMARSAT are also included, given their impact on the professional and amateur sailor alike. Material pertaining to small boats, inshore boating, licensing, antennas, equipment suppliers and EPIRB's constitute a large portion of the book.

Available from Airband Communications, Dick Smith Electronics and good boating outlets. Price $15.95.

JUST COMMUNICATIONS

"we'll get you talking"

PH (03) 873 3710
P.O. Box 50 Mitcham 3132
FAX (03) 872 4229
552 WHITEHORSE RD., MITCHAM
THE YELLOW SHOP near Mitcham Rd.

USER'S GUIDE TO RADIO

AUSTRALIAN ISLAND MAP

SHOWS:

- SAFE OPERATING AREAS FOR C.B. NOW AND WHEN THE SKIP CHANGES
- FLYING DOCTOR REGIONS
- CHANNELS TO CALL ON FOR FLYING DOCTOR AND O.T.C. RADPHONE RELATED TO TIME OF DAY, SEASON AND DISTANCE TO BASE.
- POINTING ANGLE INFO FOR AUSSAT SATELLITES
- HOW TO PASS EMERGENCY MESSAGES TO TRAIN DRIVERS
- HOW TO FIND SOUTH WHEN THE NIGHT SKY IS A FOREST OF STARS
- PRACTICAL NOTES ON GENERAL REMOTE AREA SAFETY

$6 AS SEEN ON T.V.

Mobile scanning antenna. This is the best we have found for performance. Only 1 metre in length, it is resonant on 5 different frequencies, so that if you're keen you can even transmit with this one. Scanning range is 40-950 MHz!!! Not bad for a 1 metre long stick. Ideal on a gutter mount or roof mount. $39.00

For this serious scanner . . . AH-7000 discone base antenna from ICOM.

Being ICOM manufactured, this is quality from top to bottom. Stainless steel elements discone style, with broadband coverage from 25MHz to 1300MHz. Your scanner may not go that wide!!! Complete with 10 metres of high quality coaxial cable and plugs fitted ready to go. Mounting brackets for a mast mount complete the package. Normally this sells for $232.

Special price . . . $199.00

As Advertised on Bert Newtons TV Show

$199.95 Soft Case Included. (Battery not included.)

This amazing full colour pocket sized TV has newly developed HSM (Hatadi Super Matrix) system, that significantly upgrades picture quality.

It is battery powered or can be plugged into your car cigarette lighter (*option*), or used with house AC/DC adaptor (*option*).

Also available as options are external and internal car antennas for in car Colour TV use. Please ring for prices.

NEW TECHNOLOGY

POCKET SIZE COLOUR TV

FROM PEARCE SIMPSON

- *2.2" Screen*
  PAL B/G Colour System
- *AV input jack for*
- *Video Monitor*
- *Soft case included*
- *Full Colour*
- *Automatic Tuning*

WHAT FREQUENCY IS THAT?

VICTORIA — full list	**$25**
N.S.W. — Full list	**$25**
AIRCRAFT — full list	**$25**
VIC POLICE ONLY (attaches to sun visor)	**$11.00**
VIC CFA ONLY (attaches to sun visor)	**$11.00**

MAIL ORDERS — Send to: P.O. BOX 50, MITCHAM, 3132

JUST COMMUNICATIONS

* POST $2.50
* ADD $14.00 FREIGHT

MR,MRS,MS .....
ADDRESS .....
..... P/CODE .....
PHONE .....
Please send me .....
.....
Payment enclosed for $ .....

Please charge my
☐ Bankcard ☐ Master Card ☐ Visa
Card No

Expiry Date .....
Signature .....
***Rates valid in Australia only**

CBA 0493

AUSTRALIA'S CB SPECIALISTS

Scan 1993

Continued over page....

HANDBOOK OF AUSTRALIAN RAILWAY FREQUENCIES.

PO Box 344 Springwood NSW 2777.

Produced by Russell Bryant. A5, saddle stitch binding, soft cover. To be updated about every 12 months. Details frequencies, track data, locomotive rosters, railway terms and important information for the train enthusiast. All frequencies, irrespective of their use are included. Train control, yard shunters, engineering, links and bearers are listed for Australia's government, tourist and industrial railways. A section is also devoted to New Zealand's railway frequencies.

The glossary explains in simple English, the terminology of the railway, as well as common radio usage. I know I said I wouldn't give opinion or editorialise, however just once won't hurt. If you are into monitoring the railways, even on a casual basis, you need this book! **The Handbook of Australian Railway Frequencies is available from me at the above address, or any Dick Smith Electronics store, Australian Railway Historical Society Bookshop in Redfern and the ARE Railfan Bookshop Melbourne. Price is $19.95.**

Some of the prices quoted do not include postage or handling charges, check with the individual supplier for additional costs, or price increases. In addition to the suppliers quoted in the text, there maybe others that stock them. There are no doubt other local or regional frequency and user guides on the market. *If you know of any, please write to me at PO Box 344 Springwood NSW 2777, providing details as to where they can be obtained.*

MAILBAG

IT'S NOT EASY BEING GREEN

DB, Embleton WA, says he is a `bit green' and unsure if the AR 880 handheld has what he needs in a handheld scanner.

Also is the Benelec mobile scanner aerial okay for monitoring police frequencies? One problem I encounter regularly is, enthusiasts buy a scanner that is more than they need, or lack the knowledge on how to operate it.

From your letter, I can say the AR 880 will do the job you want.

The 880 has better than average image rejection, which means you won't hear transmissions on frequencies a few megahertz away. According to the frequency coverage you supplied, the 880 will cover cellphones, at the search increment of 12.5 kHz, rather than the more correct 30 kHz. You will still hear conversations, however you will miss some. Legally you should miss all of them.

There are, to the best of my knowledge, no modifications that can be carried out on the 880 to alter the factory settings.

The Benelec claims to be broad banded, it should cover the WA police on 468 MHz without a problem.

One thing that concerns me is the VHF coverage of the 880. you state it covers 30-49.995 MHz, this band is not used much here, it is more applicable to Europe and America.

It should have 68-88 MHz, check with the supplier, they may have given you a bum steer. As far as being a `bit green', we all have to start somewhere, scanner experts are not born, they just act like babies.

WATTS WATT

DE, Lethbridge Park NSW is attempting to locate a copy of a book titled FIVE WATTS to a THOUSAND WATTS. If a reader has a copy and would like to sell it contact me and I will pass the details on.

A good book to start learning radio theory is the ARRL Handbook for Radio Amateurs.

The reading maybe a bit heavy, however, it certainly is detailed.

WAVES FROM WALLAROO

Alan, Wallaroo SA noted a few of the frequencies for his area and sent them to SCAN.

They are, Whyalla CFS 165.150, Telecom 500.175, Army (Port Wakefield) 83.340. In Adelaide he has monitored the MFS on 168.220, the STA using 486.175 and Port Taxi Trucks on 81.870.

AROUND BALLARAT

SW, Ballarat VIC would like to know some frequencies used in the central Victorian town.

The main channels are, AMBULANCE 76.250 AND 412.475. CFA 163.120 AND 163.330. CONSERVATION 71.150. POLICE 467.925 AND 168.160. ROADS CORP. 462.600, 461.650, 462.425. HOSPITAL 159.040, 164.680. TAXI 486.025, 488.950 AND THE SHIRE COUNCIL 167.500.

SECRET CODES

Several columns ago an ACT reader requested help to find out the job codes used by the AFP in Canberra. I have a printed sheet of the incident codes to hand. If anyone would like a copy, pop two 45 cent stamps into an envelope with your name and address, and I will send you a copy. Unfortunately there are far to many to print in the column.

CALL THE CORONER

In reply to a query from a Victorian reader asking if the Coroners Office had its own radio frequency, a number of readers wrote in to say it doesn't. The Coroner has been monitored using Victoria Police channels. The callsign used is Coroner 200 and Coroner 201, which is more than likely for the Deputy Coroner. Thanks to all those who put pen to paper.

FROG POWER

Alan, Morphett Vale SA recently bought a FRG 9600 communications receiver. While generally pleased with it's sensitivity and performance, he has found one drawback. Not being able to scan more than one bank of 10 frequencies is very limiting. Can anything be done to link more than one bank to the scan function? asks Alan. I owned a FRG 9600 sometime ago, the one thing that made me sell it was that it only scanned 10 channels at a time, otherwise I found it to be an excellent scanner.

To my knowledge there is no mod that allows scanning of more than one bank at a time. From information received, it is a hardware design, not software. I believe a computer program is available from a gentleman named Tom Moffit in Tasmania.

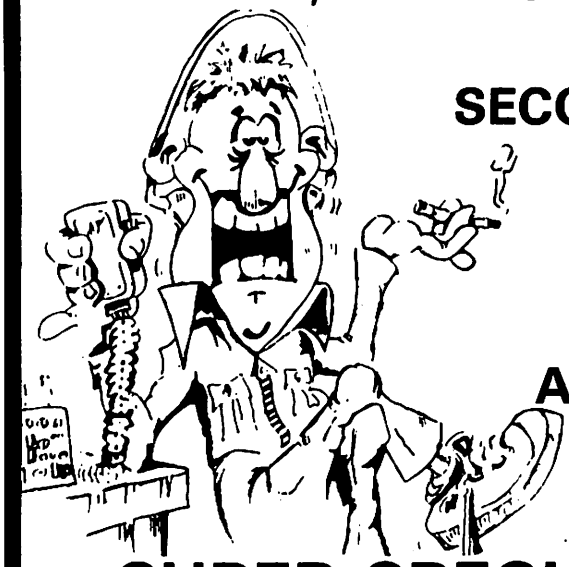
I don't know his address, however, he writes for Amateur Radio Action and always gives it when an article of his appears, check out ARA. I agree with your sentiments regarding the FRG 9600, especially with SSB, I had a HF converter fitted to mine which allowed 0-60 MHz SSB, AM and FM reception. Unfortunately nobody stocks the converters any more.

SYDNEY FREQUENCIES

Long time contributor and declared scanner user, the Secret Republican checks in with a few interesting frequencies heard around Sydney. The airband is first up with 122.000 AM Surface Movement Control and Clearances at KSA. Joins frequencies 121.7 AM and 122.3 AM. On 135.475 AM, our correspondent could hear people discussing aircraft regulations at Sydney Airport, any ideas? Okay sports fans, take the scanner along to the football at Sydney Football Stadium and tune in the ABC outside broadcast frequencies 474.275 CH.1 and 474.575 CH.2. The STA ferries that ply our harbor normally use 157.480 to control movements. A link on 413.475 also carries STA ferry traffic.

DELTA BASE COMMUNICATIONS

SALES, SERVICE AND REPAIRS TO ALL TYPES OF CB, AMATEUR AND MARINE EQUIPMENT



SECONDHAND SSB CB's from $100
Including a 30 day warranty
SECONDHAND AM CB/s from $50
Including a 30 day warranty.
SECONDHAND UHF CB's AND AMATEUR EQUIPMENT ALSO AVAILABLE
FREE CATALOGUE OF PRODUCTS NOW AVAILABLE

SUPER SPECIALS

SWR-2T S.W.R. Meters	**$15.00**
DM-435 Noise Cancelling Mic	**$20.00**
DM-453 Handheld Power Mics	**$29.00**
DM-7000 Base Power Mics	**$59.00**
DM-7400 Base Power Mics	**$59.00**

DEALER ENQUIRIES WELCOME

These prices do not include plugs or postage
C.O.D. AND MAIL ORDERS WELCOME
"Wanted to Buy or Sell on consignment any CB Amateur & Marine Radios & Accessories"

889 HIGH STREET, THORNBURY, VIC.
FAX/PHONE: (03) 484 0059

bankcard MasterCard VISA

Scan 1993

Continued from previous page....

VKM CALLING

RB, Malak NT enjoys monitoring the NT Police frequencies. Occasionally the radio operator would ask a car to switch to CH.5 which used to be 468.375, however, recently the frequency has been silent.

Our reader enlists help form anyone who may know what the frequency is for channel 5.

One way is to search the entire 64 police channels for activity. RB's second question concerns Secure Net.

Why don't police use it all the time, and can it be monitored?

Secure Net use digital technology to scramble signals, as our ears receive in analogue the digital transmissions sound like nothing more than noise.

Secure Net cannot be monitored by any NO system scanner. In other words, if you are not in the Net, you are out.

One possible reason why Secure Net is not used continuously is the degradation it causes to the radio signal. It reduces the power output significantly, thereby cutting the distance where a signal might otherwise be heard.

LINKS, BEARERS & CROSSBANDING

David, Bathurst NSW is receiving ambulance transmissions on frequencies outside their normal allocations. What are they?

Welcome to the land of links, 149.400 is one half of a link, the other frequency is 154.600 MHz, joining Mt Canobolas, Mt Lambie and Mt Panorama together.

In a recent edition of SCAN I featured an article on links, it explained how they worked and why they are used.

"Why do I hear some transmissions on crossband channels and not others?" asks David. In Bathurst 468.475 is used as a crossband for UHF cars visiting the town.

In Lithgow 468.525 is used. You may wish to tune between 467.850 and 469.425 for activity. In Bathurst 468.475 is "linked" to 83.760 which sits atop Mt Panorama.

When Orange transmit from Canobolas the receiver on Mt Panorama hears the transmission and rebroadcasts it over 468.475, which as I said are joined together.

In Lithgow you can tune up 468.525 and hear the same thing as you are hearing on 468.475 in Bathurst. Confused?

Why is Sydney heard on 83.820 MHz around Orange?

A bearer of around 2.5 GHz brings the signal from Sydney to Canobolas which is then transmitted via 83.820 to cars within 100 kilometres of the mountain.

It is mainly used for vehicle inquiries and the like.

DSE STOCK RAILWAY HANDBOOK

Dick Smith Electronics are stocking my Handbook of Australian Railway Frequencies.

It should be in all company stores now, as well as being available through selected DSE Dealers. Check your nearest store for stocks.

Frequency information, technical questions, equipment reports and just about anything concerned with scanners is reported here in SCAN.

If you would like to contribute the address is,

MOBILE MONITORING

It would be safe to say that the discone is the most popular wideband receiving aerial available to the enthusiast. Followed by the other miscellaneous monitoring whips, the market in home or base type antennae is full.

The mobile monitor on the other hand can follow one of two avenues while attempting to get the best from their car mounted scanners. They can buy one of the so-called `mobile scanning whips', or install a dedicated whip tuned to the most popular frequency or group of frequencies to which you listen.

My experience tells me that the passive, (non active), dedicated mobile scanning whips don't quite do the job.

Employing a UHF quarter wave for listening to the police 468 MHz channels is okay, provided that is all you wish to keep tabs on. If the local fire or ambulance VHF is busy, the UHF quarter wave will not do the job properly.

Mounting a `normal' mobile whip means drilling a hole in the roof of your car, not always practical or desirable.

Gutter grips, boot mounts and magnetic bases are the obvious choices when you have no wish to add a 20 mm hole to the roof of the beloved Commodore or Falcon or whatever you happen to drive.

When using alternative mounting hardware something is compromised, that of the ground plane. An aerial requires a ground to work correctly, to form the standard dipole. Depending on the resonant frequency the ground plane should be at least equal to that of a half wave.

Ground plane independent antennae are not new, they have been around in various forms for many years.

Some are co-axial dipoles, others use ground independent devices, however, basically they are able to be mounted anywhere, on a gutter grip, boot mount or even a non metallic surface such as fibreglass.

After spending many years contemplating the ideal mobile scanner aerial, I think I have come close to one that does a half decent job.

The antenna comes in two parts, the whip, which will be familiar to most radio users and the base, which is a matching transformer that screws down on to a SO 239 angled base connector. The use of an SO 239 is a departure from the usual co-axial base used by most aerials.

Electrically the whip is a five eighth wave over a five eighth wave joined together by a phasing coil. This almost metre long aerial exhibits medium gain of around 6dB over a quarter wave.

For mobile applications 6dB of gain is about as high as you need go.

Because the five eighth wave is high impedance, (300 ohms), being feed with low impedance cable, (50 ohms), a balun or matching transformer is necessary so as to avoid an impedance mismatch.

The transformer forms the bottom half of the combination, and attaches to the aforementioned SO 239 base.

Performance, in my opinion, is excellent, UHF signals previously unheard while driving around are now loud and clear. Even on mid band VHF the aerial works well, pulling in simplex mobile transmissions without a hitch.

If you are looking for a mobile scanner aerial, check out the A326, (catalogue number), from Dynamast Pty Ltd. The A326 sell for around $40 and is available from most good radio shops.

SCAN
PO BOX 344
SPRINGWOOD
NSW 2777

A stamped self addressed envelope please, if you require a personal reply.

Online 1993

By Patrick McDonald

Golly, gee!
Doesn't the old time fly when you're having fun!
I guess I must have been enjoying myself immensely these past two months.
It seems like we only just put the last CB Action and ONLINE to press.

SO WHAT'S THIS COLUMN ALL ABOUT?

I know there must be at least a few thousand new readers thumbing through this issue. Well, ONLINE is about the world of personal computers, especially IBM compatible types running the MS-DOS or Windows operating environments, as it applies to the radio hobby.

We look at computer programs that can control your radio receiver; specialised database software that can conscientiously look after the millions of frequencies you collect and want on hand instantly; clever little packages that help you learn morse code; even more clever packages that connect your computer to your receiver and decode RTTY, morse code and so forth; glitzy gear that predicts propagation conditions anytime, anywhere, and which show `from the Moon' shots of planet Earth . . . and much more.

We also take regular note of those computer-linked systems, like FidoNet and InterNet, that allow radio users to use their PCs to access (via the telephone lines) international databases or "bulletin board systems" for the purpose of exchanging said software and the latest scanning and shortwave frequencies, gossip on new radio gear and lots more.

Now you know what we are supposed to do in these pages. So let's go and do it!

ICOM R-7000 CONTROLLER

First, we should have a quick look at the Icom IC-R7000 Receiver Control Program (known in its compressed form as ICR7000.ZIP) created by Bart Wolther N2PXJ, in the USA.

The hardware requirement for this package (apart from the super Icom R7000 receiver!) is a CT-17 or other compatible radio interface, to connect your radio and PC.

The program is "freeware", which means that you can use it and share it with others when you like.

The author requests no registration fee.

Basically, this is a fairly simple program that keeps track of your radio frequency databases and allows you to load them in various combinations into your trusty R7000's memory channels.

You can do with the ICR7000.ZIP all the usual things that a computer database does: edit all entries, add and subtract frequencies in various categories, do all manner searches for data, etc.

The neat feature of this particular program is that, after specifying a particular data search, you can then load the relevant frequencies directly into the radio.

Once channels are loaded from the database, you can use the PgUp and PgDn keys to switch through memory channels, and the program will display the corresponding channel descriptions as you switch.

Author Wolther recommends building an optional squelch-detect cable to make use of the program's ability to recognise the R7000's squelch status, which in turn allows the program to know if the radio is tuned to a coherent transmission.

This cable is a quick solution to a major shortcoming in the R7000's hardware computer interface: an inability to detect the radio's squelch status.

The cable works by connecting your radio's remote jack to your computer's parallel port.

The construction is not difficult and should be do-able by any radio enthusiast with basic cable-cutting skills and access to a corner electronics parts shop. Helpful tips are included in the ICR7000.ZIP documentation.

CONTROL YOUR KENWOOD

Yet another interesting radio control program is Kentrol, also known as KTWN3A.ZIP, designed by Canadian radio amateur Brian Gilhuly VE3BGB.

As the name implies, it's designed to control Kenwood HF transceivers and the well-known Kenwood R5000 receiver, and cleverly auto-detects and adjusts to the TS-940/440/140/680S, the R5000, and the TS-950/850/450/690S.

It'll also work with any other radio which uses the Kenwood control language.

A nice feature of Kentrol is the helpful Toolbar constantly in view.

This shows the active frequency and mode and provides buttons for all key radio control functions, including keyboard frequency entry.

Toolbar buttons are always accessible regardless of what you are doing in the program.

Kentrol automatically logs UTC date and time, frequency, mode and band, along with your choice of text fields, to a pure ASCII log file.

You can view and edit the log file within Kentrol itself or load it into your own database.

The Kentrol Tuning Window tunes both VFOs and selects memory channels using a scroll bar interface. You can tune any source at any time, independent of that which you are listening to or transmitting on. You can also enter frequencies directly from the keyboard or via the tuning scroll bar.

The bandspread of the scroll bar can be full range, a single MHz, a single ham band, a single broadcast, utility, aeronautical or maritime mobile band, or one of up to 11 user-defined bands.

In a particular band, the Sub button automatically sets mode and tuning step according to frequency, following US, Canadian and international band plans.

Other pushbuttons allow you to jump up and down a band or MHz at a time.

The useful Autoscroll feature moves the bar along through the range you have selected, at a selectable speed. You can also jump bands or change sources while autoscrolling.

In memory mode, empty channels are skipped automatically.

Simultaneously, Kentrol's Available Channels Window displays the contents of your radio's memories so you can select any particular memory with a single click of the old mouse.

Finally, Kentrol's Monitor Icon mode displays constantly updated frequency and mode information at the bottom of your screen while other applications run in the foreground and you control your radio from its front panel.

Now, please take note that Kentrol needs an 80286, 80386 or 80486-based IBM-compatible computer with at least one serial port, running Windows versions 3.0 or 3.1 in either standard or enhanced mode. (Earlier versions of the program will run from DOS on basic XT computers, and I will try to find one of these and put it on-line at SWP BBS for those of you without the above hardware.)

Even more features are available, including control of split frequencies and so forth, for those Kentrol users who register their packages and pay the modest "shareware" registration fee.

As you can see, this is more complicated software than the one for the R7000, but it's relatively easy to install and has plenty of help screens built in.

MORE TO COME

I have a couple more computer/radio control software packages still sitting here on the desk (and available on-line at the famous Shortwave Possums BBS), waiting to be reviewed. But I think I'll have to hold them over for the next issue of CBA. It's great to see that software programs are being cranked out regularly by various devoted radio and computer boffins, worldwide.

continued over page...

BEATING PC NOISE

This topic, though, has brought to my little mind the age-old problem of computer generated electronic noise, and I think many of you gentle readers would like to hear a bit about this.

It always seems totally unfair that once you start using a computer to operate your radio you get lots of extra buzzing and crackling on the airwaves. Sometimes this seems to totally defeat your original purpose! And worse still, when you start looking into RF noise, you begin finding a host of other RFI sources, all around the house.

So what to do? Well, here's a way to proceed that has worked for some folks . . . and which may help your listening. I give thanks to well-known American radio listener Tom Kashuba for some of the better ideas.

1. Turn on ALL the electronic appliances in the whole damn house. This may sound like a strange way to start, but we have to make sure that every possible source of RFI is present for this experiment. (Your house will really be full of action at this point!)

2. Next, put on the headphones and scan all your normal frequencies for RFI.

Make noise-notes of both the frequency and type of noise. You might find that drawing a little graph helps clarify things here.

3. Now that you have mapped out the problem areas, TURN OFF everything electronic in the house (except for your radio receiver, silly). This can be a problem if you're married or have a `significant other' addicted to electronic appliances.

Pick your time carefully!

Then, scan the problem areas that you've mapped out. If you still hear noise on some frequencies, you've unfortunately found electronic annoyance outside your personal household, and you may have to leave this particular problem area for later, and/or learn to live with it. (Of course, you can always plan to retire to a log cabin in one of the deeper regions of the upper Blue Mountains, but that's not a topic I want to go into right now!)

4. Here's where the science experiment begins.

Start turning ON your appliances, one by one.

After each one is fired up, re-scan all previously noted problem frequencies. Do this until all your electronic appliances are running again. In the case of your home computer(s), you should observe a fair bit of new noise being generated after you flip the red switch.

Make sure you also rev up the computer by running a program that activates the hard disk and the monitor. And don't forget to get the monitor, modem and printer going too, one at a time.

After this, you'll have a pretty darn good idea where your electronic noise is coming from and can start taking action. (You didn't find any noise? Please contact me as soon as possible. I'll be right over with my suitcases and R71A, to move in and live with you for the rest of my life!)

SO WHAT TO DO NOW?

OK, seriously now, you will surely have found some noise coming from a computer. Repeat your earlier detective work but by turning off or unplugging each peripheral and scanning the problem areas again. In particular, try unplugging the video cable from the computer (not from the display).

It's often the case that the TTL cables commonly used today (not the hi-fi style CGA/RCA type) are the very worst noise-makers, since they are improperly shielded.

If you use a lowly CGA monitor, you're in luck.

Use the RC style "composite" RF cable, not a TTL cable.

Unfortunately, the later standards of EGA or VGA don't support a composite signal and, thus, have only a TTL style of connection.

Then there's the computer central processing unit itself. A CPU clock typically runs at twice the published speed and is stepped down in a frequency divider circuit. So, with a 10 Mhz CPU, you may have strong RFI at 10, 20, and 40 Mhz.

Add to that the electrical actions that result from an executing program and you get a lot of intermediate frequencies.

SOLUTIONS . . .

So here are some solutions, some easy and some not.

1. Change your antenna lead-in to shielded coax cable and run it as far away from your computer as possible. Play around with your various cables a bit while listening to the RFI and try different positions. You may hit upon the optimum, least noisy locations.

2. Locate your antenna at least 30 metres from your computer or any other chronic noise-makers.

3. Make sure all cables are shielded and grounded to the chassis. This should also include your RS-232 cable.

4. See that your TTL monitor cable is shielded.

5. Consider getting another monitor or printer, if yours are noisy.

6. After all of the above, try adding RFI chokes on all cables, including RS-232 and modem.

7. Throw away and/or hide any of your wife's appliances that make too much noise.

WILL THIS APPROACH WORK?

Nope! I mean, you'll never get rid of all electronic noise in today's busy, buzzy world. But you may well reduce a lot of it. Some folks claim to have cut the dreaded RFI by up to 95 per cent.

Realistically, you can hope for a 50 per cent reduction, depending on your particular household, and you can gradually replace noise-generating appliances as time goes on. Be especially aware of this problem next time you win the lottery and go out to upgrade your current PC and monitor. Remember that computers, monitors and printers can vary greatly in the amount of electronic noise they generate.

Anyhow, good luck with your RFI removal efforts!

Please send your tips and suggestions to me here at CBA and I will share them with others.

TELIX COMMUNICATIONS PROGRAM

On to something entirely different.

The new version 3.21 of the legendary Telix communications program is now out, and is better than ever. Basically, this sort of software is what you run on your computer so that you can use your modem for telephone connections with computer bulletin board systems.

There are many such beasts available but Telix is one of the originals and still the best, in my humble opinion. It's shareware, and can be found on a great many BBSs.

Some excellent Telix features include the capacity to keep readily at hand all your passwords and parameters, for a great many BBSs. In fact, Telix can be configured to connect automatically to a specific BBS, give your name and password and automatically get started on whatever BBS activity you're about . . . the sky's the limit with Telix's SALT programming language.

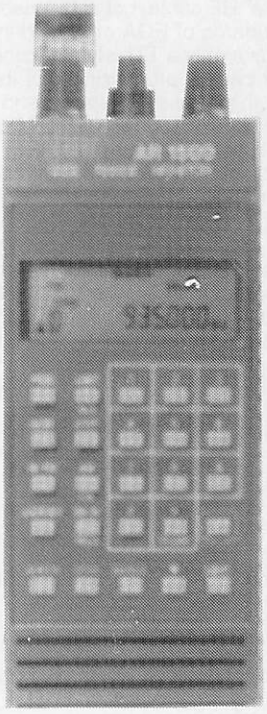
As well, Telix offers the fast and reliable Zmodem file transfer protocol, as well as the old faithfuls like Xmodem and Ymodem. I could go on and on here, but reviews of communications programs are slightly wide of ONLINE's intentions and I'd like to save the space for more radio stuff.

Suffice to say that if you're new to the modem game, or are using a commercial, non-BBS orientated communications package, try Telix.

You'll be glad you did!

TIME PLUS PTY. LTD.

C.B. RADIO EXPERTS FOR 18 YEARS SAME OWNERS



SPECIFICATIONS

Frequency Range	500KHz - 1300MHz
Step sizes	5KHz to 995KHz user programmable in 5KHz or 12.5KHz multiplying
Sensitivity	FM - 0.5uV or better AM - 3uV or better
Modes	AM, Narrow FM and Wide FM
Scan Speed	Approx 20 channels/second
Search Speed	Approx 20 steps/second
Memory channels	900 channels plus 100 channels auto memory channel, total 1000 channels
Search range memory	9 normal search banks and 1 search banks for automemory search pair
Priority	2 sec of sampling rate
Antenna Input	50 ohm BNC connector
Audio Output	100m W at 10% THD or better
Power supply	6V DC from built-in Ni-Cnd battery pack or 11-18V DC from CHG jack.
Size	55(w) x 152(l) x 40(d)mm
Weight	385gram

AR 1500

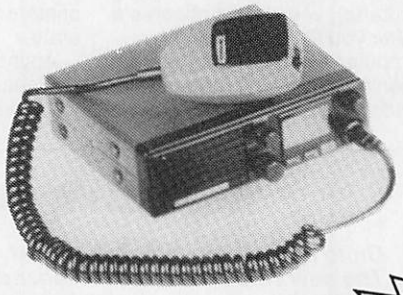
AS REVIEWED CB ACTION JAN/FEB 1993
BUY BEFORE JAPANESE YEN AFFECTS PRICE AGAIN

Only $699

OTHER TIME PLUS SPECIALS

Station Master Aerial $69.00
4 Amp Panther Power supply $89.00
2 Amp Panther power supply $59.00
Leson Desk Mics, wired $99.00
Electrophones Desk mic, wired $79.00
Uniden Pro 810e Base station $399.00
Uniden PC122 AM/SSB Mobile CB $259.00
Uniden AX144 AM/SSB Mobile CB $279.00
Uniden Grant, Ultimate CB $349.00
Uniden Pro640e, Deluxe CB $319.00

ELECTROPHONE TX4000 UHF& TX4000S REMOTE MOUNTED UHF



* Sel-Call
* Scanning
* LCD Display
* Front Mounted Speaker
* Signal Strength Meter
* Australian designed and manufactured

PLENTY IN STOCK RING FOR PRICE

SPECTRUM THE ULTIMATE FREQUENCY REGISTER ALL STATES PLEASE ENQUIRE

We Stock everything for scanners, base aerials, Visor cards, Spectrum freq list, Fanatics Freq list & Knowledge on subject

TIME PLUS PTY. LTD.

55 Sydney Road
BRUNSWICK VIC 3056
Phone: (03) 380 4172, (03) 380 4942
Fax: (03) 387 0401
ALL MAJOR CREDIT CARDS ACCEPTED
Open Mon-Fri: 9am to 5.30pm, Sat: 9am to 12.30pm.

EXPERT REPAIRS

MAIL ORDER SPECIALIST
MAIL ORDER HOTLINE
(03) 380 4172

Online

NEW BBS SYSTEMS

Now let's briefly take a look at a few bulletin board systems that might well benefit radio and communications buffs.

The first one I want to mention is Paul Britton's Sydney-based Satcomm Australia BBS, open all hours on ***(02) 905 0849.//***

SYDNEY SPACE/SATELLITE BBS

A long-time denizen of the BBS radio scene, Paul offers lots of special software files and message areas for those interested in space and satellite communications.

This is an attractive and highly professional system and accepts speeds up to 9600 bps. As an added bonus, Satcomm Australia seems to carry everything that opens and shuts for Flight Simulator afficionados!

A NEW ONE FOR QUEENSLAND

A new system of possible assistance to Brisbane radio folks is The Sanctuary BBS, operated by Gary Scafe on ***(07) 268 1660.***

This BBS is just starting out, but with the patronage of Queenslanders interested in having radio software and message bases active in their midst, could grow quickly.

By the time this issue hits the streets, Gary hopes to have a 9600 bps modem connected.

...AND OF COURSE SPECTRUM

Finally, don't forget that Spectrum Radio BBS is continuing to thrive in dear old Melbourne.

Michael Evans has an enormous amount of shareware and freeware software available on-line, including several CD-ROMs, and operates at speeds up to 9600 bps. Spectrum, to be found via ***(03) 819-9167,*** caters to a wide range of radio interests, but has particular strengths in the area of packet radio.

HIGH SPEED POSSUMS

Finally, there's good news from your mates at Shortwave Possums BBS.

We've got a nice, shiny new 14400 bps modem on-line now, thanks to the good folks at Robert and Roberts Computers in Sydney, and this will mean much lower costs for those radio nuts in the country areas of NSW who have to make STD calls. See our phone number at the end of this column.

Oh, yes . . . one more thing. We'll repeat our special SWP disk offer once again with this CBA issue, as postal requests for computer programs have continued to be modest.

Send your cheque or postal money order for $35, along with six formatted floppy disks, any size, to the familiar address of ***Shortwave Possums BBS, PO Box 357 Round Corner NSW 2158.***

Cheques may be made out to `Shortwave Possums.'

I will then rapidly return to you (unless your request arrives in the midst of my upcoming annual holidays) a sample collection of the most popular radio-related shareware and freeware software suitable for IBM compatible computers.

Remember, however, that these same programs are freely available at many BBSs around Australia. So why not consider buying a modem this very month?

I may well mention the modem scene in my next ONLINE, as a matter of fact.

Well, this looks like all I can squeeze into this issue of CBA, gang!

We don't want the editor coming at the end of article with a meat cleaver, do we?

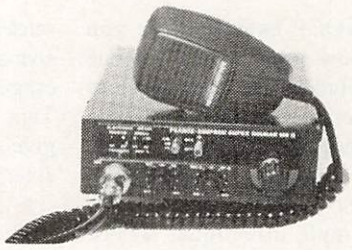
Keep in touch until the next great issue, by sending suggestions via modem to ***SWP BBS on (02) 651-3055,*** or by writing to me at the above paper-and-pencil address.

I'd especially like to hear about your experiences in battling with computer noise!

And so . . . ta ta!

CLASSIC AM RADIO'S

Just keep on Truckin'



PEARCE-SIMPSON
Super Cougar MKII
Here to stay
And The
NEW !!
AM 810

PEARCE-SIMPSON
Service & Quality
You can Trust

Distributed By Hatadi, Electronics Corp Aust P/L,
P.O. Box 543, Mona Vale, N.S.W., 2103
Ph: (02) 997 7077 Fax: (02) 99 1229

SO YOU WANT TO BE AN AMATEUR?

THE PATH TO AMATEUR RADIO

Part Six of a regular series by Paul Butler - VK3DBP

For the NAOCP examination, you need to know some general antenna theory, including the characteristics of vertical and horizontal antennas and the importance of standing wave ratio (SWR). In more detail, you must have some knowledge of half-wave and quarter-wave antennas and simple directional arrays. We'll have a look at these in this article, and explain what all these odd-sounding terms mean. Then we'll have a look at the theory surrounding transmission lines and finish off with a few questions as usual. So, here we go with antennas.....

The antenna itself is one component of the antenna system, which includes the transmission line and any devices used to match the transmitter and receiver to the antenna. If the antenna system is working properly, the antenna is the only component which radiates energy. A low standing-wave ratio is essential for effective operation and the impedance of the antenna must match that of the transmitter.

While in an ideal system these conditions are readily met, in a practical setup there are always difficulties - the antenna height is never quite right, the transmission line never performs as it should in theory, the ground beneath the antenna is never ideal. Antenna design is one thing, antenna installation is another and often involves a degree of trial and error before the performance of the system is good enough. A little antenna theory is invaluable, therefore, for the active amateur radio operator who wants that extra edge. And that's you, of course.....

The most expensive transceiver in the world, with all its bells and whistles, is of no use at all without a decent antenna. What makes an antenna operate well, however, is not simply its cost or complexity. A few basic ideas about antennas, together with a good deal of common sense, can produce an relatively inexpensive antenna system capable of world coverage from even a modest base station. This is why low power (QRP) operators give so much care and attention to their antenna systems.

ANTENNA GAIN

The NAOCP syllabus does not include very much about antenna characteristics, especially gain. But if you are going to experiment with antennas, you will certainly want to make some comparisons between different types. This means that you will need to have a working knowledge of antenna gain.

At last, all you ever wanted to know about antennas, gain - and all that sort of thing.

The performance of any real antenna is usually compared to the simplest theoretical antenna, which does not even exist! This is called an isotropic radiator, which in theory would radiate with the same intensity of signal in every direction. Radio waves would spread out from an isotropic radiator, if it existed, as an ever-expanding sphere. This idea is used to establish a standard against which to compare the effective radiated power (ERP) of a real antenna, that is, how much more strongly it radiates than the mythical isotropic radiator. Comparisons of this sort between two antennas are expressed in decibels (dB), which is a useful way of expressing a ratio. When an isotropic radiator is the reference, the ERP will be calculated in dBi (i for isotropic).

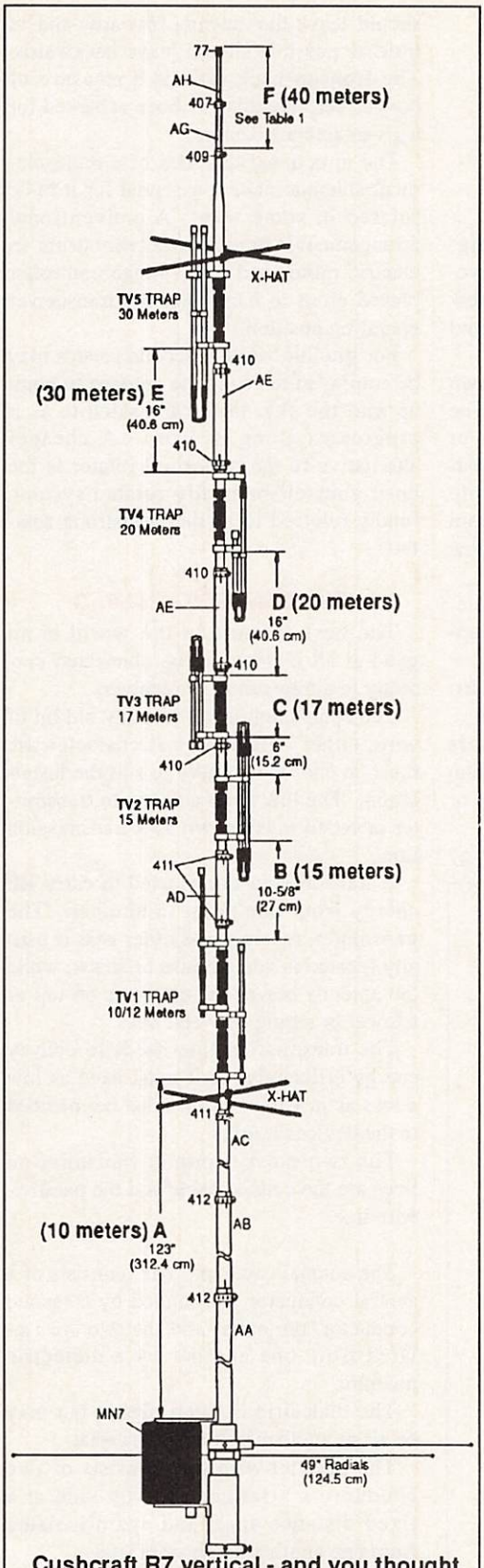
In practical terms, ERP is measured with reference to a real antenna, the dipole, which itself has a theoretical gain of 2.14 dB when compared to an isotropic radiator. Practical measurements of ERP are therefore expressed in dBd (d for dipole). To turn an ERP in dBi into one in dBd, simply subtract 2.14. When reading antenna specifications, check whether the ERP figure is in dBd or dBi, since the quoted antenna performance may appear to be more than 2 dB higher than its actual performance!

The chat above about gain may seem a bit over the top when it comes to passing the NAOCP exam. It is important, however, to be aware of practicalities, rather than just sticking to the basic exam essentials. So, on we go.....

THE HALF-WAVE DIPOLE

A dipole antenna is a conductor approximately one half-wavelength long. Its actual length is determined by the thickness of the conductor from which it is constructed. The final length of a dipole is found by making it too long initially, then trimming it carefully while measuring its electrical characteristics, in particular the standing-wave ratio (SWR). It will end up slightly shorter than the theoretical one half wavelength.

The aim is to establish a resonant condition, so that the antenna is matched to a



Cushcraft R7 vertical - and you thought your u-beaut Station Master was big. This quality amateur antenna covers all ham bands from 10 to 40 metres - and fits them all into a height of just 6.9 metres.

particular frequency of transmission. This does not restrict the use of the antenna to a single frequency, however. A well-made dipole will perform well over most of an amateur band.

Radio frequency energy is fed into a dipole by dividing it at its centre and connecting it via the two leads of the transmission line to the transmitter. A dipole is most commonly erected parallel to the ground. The radio waves emitted from the dipole will be strongest in a direction perpendicular to its axis, as long as it is at least one half-wavelength above the ground. A well-placed dipole will emit radio waves at a low angle to the horizontal, the ideal for long-distance communication. If the dipole is too close to the ground, however, the radiation angle increases and most of the energy goes up at too high an angle to be useful.

When a dipole is energised by the transmitter, patterns of voltage and current are set up along its length, called standing waves. The current is a maximum at the centre, where the transmission line is attached, and falls to zero at the ends. The voltage is maximum at each end and passes through zero at the centre.

This standing-wave pattern produces a characteristic impedance at the centre of the dipole equal to the ratio of voltage to current (R = V/I). The transmission line connecting the transmitter to the antenna should have the same impedance as the antenna, for best performance. The impedance of a dipole makes it suitable for feeding through 50 ohm or 75 ohm coaxial cable. If each arm of a dipole is constructed from two wires connected together at the ends to form a folded dipole, the impedance is increased and 300 ohm open-wire TV ladder line can be used as the transmission line.

The same antenna can be used over a series of high frequency (HF) amateur bands because the bands are related in frequency. A dipole may be cut for 80m but perform equally well on the 40m, 20m and 10m bands. The voltage and current distributions associated with each frequency will give rise to different impedances, however, and a matching network will be required to change the impedance of the antenna in each case to that of the transmitter.

VERTICAL ANTENNAS

Turn a half-wave end fed antenna on its side and you have a half-wave vertical, quite an effective antenna which takes up little space and so is a favourite with many amateur radio enthusiasts. A true half-wave vertical can be difficult to realise, however, particularly on the lower, long wavelength bands, because of its excessive length.

A quarter-wave vertical radiator is a very popular alternative, but relies heavily on a good ground plane. This acts like a mirror, so that the real conductor above the ground operates together with its reflection in the ground plane. While the ground itself could in theory provide the reflective properties needed for a ground plane, in practice its conductivity is never high enough. A conductive ground plane must be provided by the antenna builder, therefore, in the form of a series of conductors close to and parallel with the ground. These radials are cut to be resonant at the operating frequencies of the antenna and the underlying principle in installing them is "the more the merrier"!

A ground-mounted vertical has to be surrounded by the radials, making mowing the lawn or getting around the garden quite difficult! One recommendation is to provide 40 to 50 radials, each two-tenths of a wavelength long. A roof-mounted vertical on its own is acceptable but the spray of radials may be just enough to get the neighbours up in arms. The vertical section is one-quarter of a wavelength long, as are all the radials, and a set of radials is needed for each band of operation. One solution to the radial problem is to use a no-radial vertical.

DIRECTIONAL ANTENNAS

Ideally, the radio frequency energy your transmitter generates should not be sprayed liberally around the place but directed towards your target area. To achieve this, an antenna is needed which has directional properties. The radio wave is focussed by such an antenna into a beam, like the beam of light from a torch. Directional antennas generally consist of several dipole elements suitably arranged. We often refer to these antennas as beams or directive arrays.

continued over page...

SO YOU WANT TO BE AN AMATEUR?

(continued from previous page)

A distinction must be made, when dealing with multi-element antennas, between the driven element and the parasitic elements. The driven element provides the connection to the transmission line linking the antenna to the transmitter and it produces the radio wave.

Parasitic elements do not have a direct connection with the transmitter but modify the radio wave as it leaves the antenna.

They can be directors, arranged in front of the driven element, or reflectors, behind the driven element.

The operation of parasitic elements depends on their accurate placement relative to one another and to the driven element.

Radio energy leaving the driven element generates currents in the parasitic directors, which in turn generate further radio waves.

If the spacing of the elements is correct, the new waves will be in step with the original and add to it, reinforcing the original wave in the antenna's forward direction. The reflector similarly produces new waves, which again add to the original wave in the direction of the beam.

The simplest array of this type, known as the Yagi, is the two-element beam. The second element can act as a director or reflector, depending on its placement relative to the driven element. A simple arrangement like this can produce a gain of the order of 5 db or so over the driven element operating on its own.

A three-element array has a driven element, a director and a reflector. Its theoretical gain is about 7 dB.

The reflector is cut longer than the driven element, the director is cut shorter.

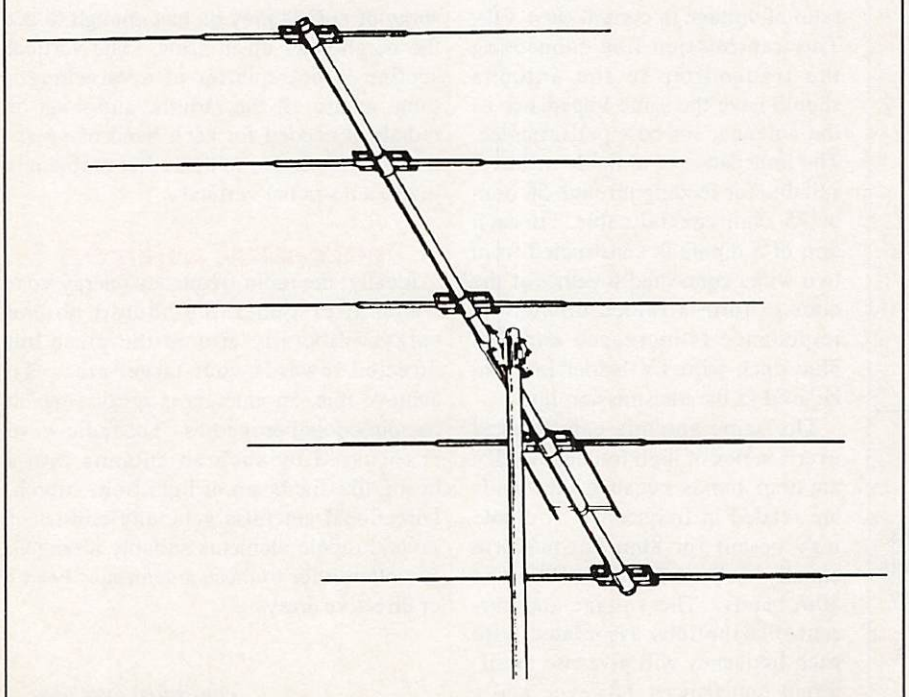
To obtain more gain, further directors can be added, each slightly shorter than the last, to form a multi-element beam or long yagi.

As much as possible of the radio energy should leave the antenna forwards and as little as possible should leave backwards. The front-to-back ratio is a measure of how effectively this has been achieved for a given antenna design.

The directional qualities of a multi-element antenna make it essential for it to be rotated in some way. A conventional arrangement is to rotate the beam using an electric motor and low-voltage controller placed close to hand near the transceiver operating position.

For satellite work, a second rotator may be employed to swing the antenna to point up into the sky, to track a satellite as it progresses along its orbit. A cheaper alternative to the motorised rotator is the do-it-yourself manually rotated system, fondly referred to as the Armstrong rotator!

This impressive Yagi is a Hy-Gain 5 element `Long John' for the amateur 15m band. The boom length is 7.92m (26 ft) and it has a gain of 12dBi.



TRANSMISSION LINES

The best antenna in the world is no good at all if it cannot be connected correctly to a transmitter or receiver.

The connection is not just any old bit of wire, either - its electrical characteristic must be chosen carefully to suit the installation. The link from antenna to transmitter or receiver is known as a transmission line.

A transmission line is used to carry RF energy from one point to another. The transmitter, receiver and other gear is usually located inside a house or shack, while the antenna braves the elements on top of a tower or strung between trees.

The transmission line needs to convey energy efficiently, so it must have as low a loss as possible, and it must be matched to the devices it joins.

The two most common transmission lines are the coaxial cable and the parallel-wire line.

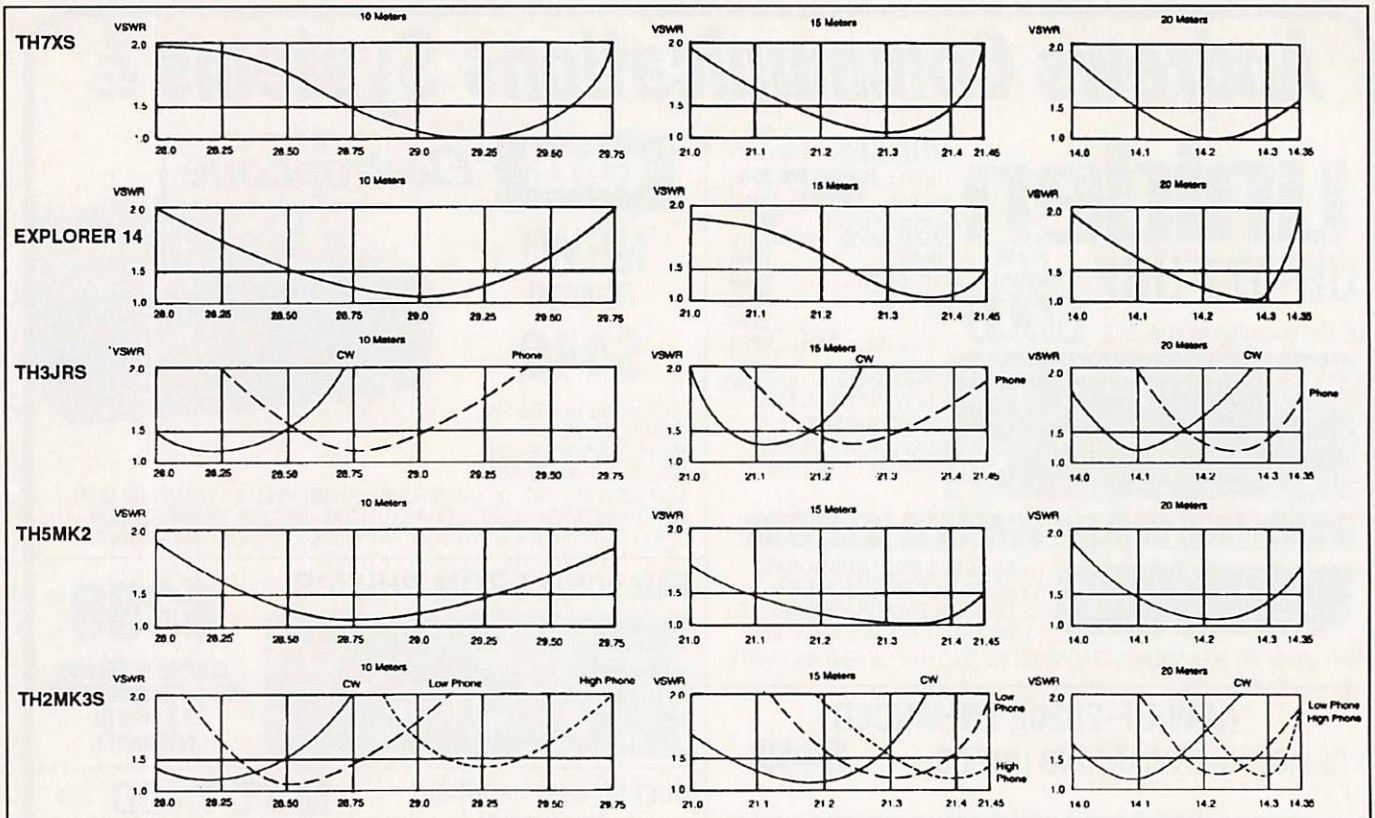
The coaxial cable, or coax, consists of a central conductor surrounded by a second conductor, the outer, and the two are isolated from one another by a dielectric medium.

The dielectric is often plastic but may be air or another insulating material.

The parallel-wire line consists of two conductors arranged side-by-side at a fixed distance apart and again isolated from one another by air or plastic.

Equal currents flow in a correctly operating parallel-wire transmission line, so it is often called a balanced line. The coaxial cable is an unbalanced line.

All transmission lines have a characteristic impedance. Large, closely spaced



Above are a selection of VSWR curves as provided for Hy-Gain multiband beam antennas.

conductors produce a line with low impedance; small, widely spaced conductors produce a line with high impedance.

STANDING WAVE RATIO

As radio frequency (RF) energy leaves the transmitter (the forward wave), it meets RF energy which has been reflected from the antenna (the reflected wave). The voltage at any point along the line is, therefore, the sum of the waves travelling in both directions along the line.

At some points along the line, the forward and reflected waves will be in step and add together. At other points, the voltages will be out of step and cancel. These additions and cancellations form a standing-wave pattern of voltages along the transmission line. The ratio of the maximum voltage on the line to the minimum voltage on the line is called the voltage standing wave ratio or VSWR, often abbreviated to SWR.

The nature of the antenna determines the SWR, which should be as low as possible, ie. close to 1.

A higher SWR may exist because of the difficulty of matching the antenna to the line.

Either the high SWR must be tolerated or some form of matching must be introduced between the line and the antenna.

Every antenna and every transmission line has its characteristic impedance. Any antenna can, therefore, be used with any line as long as the impedance is transformed to achieve a match.

The dipole antenna mentioned above has an impedance low enough for 50 ohm or 75 ohm coaxial cable to be used as the transmission line.

Folding the arms of the dipole into a folded dipole configuration has the effect of raising the characteristic impedance to 300 ohm, just right for feeding with a 300 ohm open-wire TV ladder line.

An antenna which is symmetrical relative to the feed point, such as a dipole, is best fed by a balanced line.

Often, however, it is more convenient to use coaxial cable as the feedline, since it easy to handle and does not need to be supported in the same way as a balanced line.

The impedance of a simple dipole is close to that of commonly used coaxial cable, too.

Using coax upsets the inherent balance of the dipole and can cause unwanted RF currents to flow in the feedline.

To match a balanced antenna to an unbalanced line, a balun is needed. The name derives from the purpose - BALanced-to-UNbalanced.

A balun consists of two coils wound onto the same core, with the ratio of their turns arranged to provide the necessary change from balanced to unbalanced without changing the impedance 'seen' by the transmission line and antenna. Impedance transformation may be incorporated into the balun as well.

A 4:1 turns ratio, for example, will effectively match a 300 ohm balanced antenna with a 75 ohm unbalanced line, should the need arise.

Given a particular combination of transmitter, feedline and antenna, the optimum conditions may not be achieved without a little extra help from an antenna tuning unit (ATU).

The term ATU is often replaced by 'antenna coupler' or, in ARRL publications, the term 'Transmatch', since this kind of device is designed to match a transmitter's output to any load presented to it. The device consists of an adjustable series or parallel tuned circuit.

continued over page...

Andrews Communications Systems

EST 1978 ACN 001 968 752

uniden

UH-077 UHF 2 YEAR WARRANTY **SOLD**

DELUXE SCANNING 40CH MOBILE....

UHF CBs 2 YEAR WARRANTY

UH.011 ECONOMY MOB ~~$299~~

UH.055 HANDHELD ~~$499~~

SSB CBs 2 YEAR WARRANTY

GRANT ~~$339~~

PRO.640XL ~~$329~~

AX.144 ~~$299~~

PC.122 ~~$279~~

PRO.810E BASE ~~$479~~

AM CBs 2 YEAR WARRANTY

NEW PRO.535E $199

PRO.330E $145

CALL NOW FOR BEST UNIDEN CB PRICES...

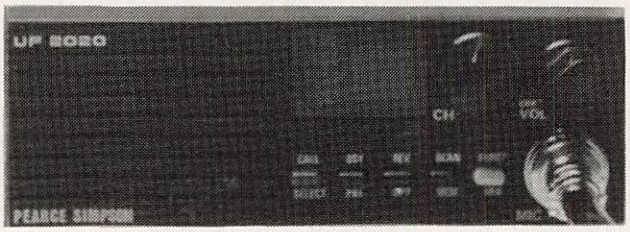
UNIDEN HIGH QUALITY SCANNING RECEIVERS

☆ BC-760XLT 100CH MOB $429(PIC)
☆ BC-200XLT 200CH H/H $429
☆ BC-100XLT 100CH H/HELD $349
☆ BC-50XL 10CH, BASIC H/H $199

WHY PAY MORE ELESWHERE? AC ADAPTOR INC.(EXC. 50XL) 2-YEAR WARRANTY.

NEW UF-2020E ENHANCED

REMOTABLE SCANNING UHF CB..... **$449**



.UF-2020E IS AN UPGRADED, RETUNED, "DE-BUGGED" & SPECIAL RECEIVE FEATURED UHF CB, EXCLUSIVE TO A.C.S.

PEARCE-SIMPSON

☆ LEOPARD MK.2, UHF CB 40CH, 12V/24V OK! ONLY....**$249**
☆ UF-2020 STANDARD VERSION UHF CB MOBILE.....**$349**
☆ SUPER LION MK.2 SSB CB...$199 ☆ S.CHEETAH MK.3 SSB...**$199**
☆ ST-901 COMPACT SSB CB, "A QUALITY MOBILE", ONLY **$199**
☆ SUPER COUGAR MK.2...$99 ☆ SEA SIMBA 10CH MARINE...**$99**

WHY PAY MORE ELESWHERE? 12 MONTH WARRANTY.

MIDLAND 70-530 'COMMERCIAL' UHF CB MOBILE FEATURES SUPER HOT & SPECIAL RECEIVE, SCANNING, ETC, $799

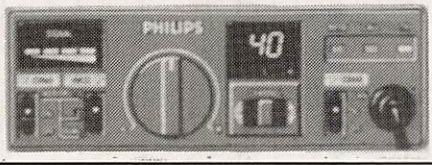
TOKYO HIGH POWER UHF LINEARS, HL-63U $599, HL.130U $999 PALOMAR HF LINEARS, TX-2250 180W $229, TX-5500 DELUXE 350W $429. WE IMPORT FACTORY DIRECT TOKYO HY POWER+ PALOMAR. LINEARS NOT LEGAL FOR CB.HELIAX, PLUGS, SCAN WHIPS, TUNERS WORLD CLOCKS

GME Electrophone

NEW!
TX-4000
$449

SCANNING UHF CB 5W TRANSCEIVER INCLUDES 5-TONE, SEL-CAL (BUILT-IN). LARGE LCD DISPLAY, ETC. ☆TX-475S UHF CB HANDHELD 2.5W SUPERB QUALITY TRANSCEIVER $599 ☆TX-830 DELUXE AM $149, TX-840 SSB/AM $299.(TX4000R DUE NOW) WHY PAY MORE? 12 MONTH WARRANTY

FM650SD FROM PHILIPS...



$399

DELUXE SCANNING UHF CB TRANSCEIVER. 12 MONTH WARRANTY.

Must be best handheld in the world!

MVT-7100

NEW! SUPERWIDEBAND ALLMODE YUPITERU SCANNER. 0.1-1,650MHz, 1000CH MEMORY $950

MVT-7000

HANDHELD HI-TECH 0.1 TO 1300MHz SCANNER $799 200 CHANNEL AM-FMN-FMW

MVT-8000

MOBILE HI-TECH 0.1 TO 1300MHz SCANNER $799, 200 CHANNEL AM-FMN-FMW

Made in Japan. Importer 1 yr warranty. High performance scanning receivers

EMOTATOR ROTATORS ...CALL

MADE IN JAPAN. FACTORY DIRECT IMPORTER. EXCELLENT QUALITY

AOR *FREE SOFTWARE INC.

☆ AR-3000A 0.1-2036MHz.....*$CALL
☆ AR-1500 0.5-1300MHz H/H.....$CALL
☆ AR-1000XLT AM-FM-FMN H/H.....$CALL
MADE IN JAPAN SCANNERS, 12 MONTH WARRANTY

DIAMOND ANTENNA CORP. JAPAN; D130J DISCONE $169, D707E A.ANT. $299. MOBILE ONE COL-6M MOBILE H/DUTY 6dB UHF ANT. $149, COL-6 BASE 'N' $79 BENELEC 12dBi TOP BASE COLLINEAR $199.HATADI 12dBi $149, ZCG 9db+ $129 DIAMOND AUST. 5dB WHIP $29,4.5dB WHIP $19. YAGIS TO 30 ELEMENTS, MOBILE WHIPS TO 9dBi BASE & MOBILE MICS, BASE 27MHz VERTICALS, COAX, TVI FILTERS, RANGER RCI-2950, SANGEAN RX, DIGISCANS, FREQ. REGISTER $20. WE SELL ALINCO-KENWOOD-ICOM-STANDARD-JRC AMATEUR EQUIPMENT.

-NEW ADDRESS-
(02) 349 5792 OR 344 7880
795 ANZAC PDE, MAROUBRA JUNCTION, NSW, 2035
FAX (02) 349 3366
PO BOX 33, KENSINGTON, 2033

CALL SYDNEY
(02) 636 9060 or 688 4301
SHOP 8, 41-51 BATHURST ST GREYSTANES, NSW 2145 (NR GREAT WESTERN HWY)
BANKCARD-MASTERCARD-VISA

CALL MELBOURNE
(03) 720 5900 OR 720 5280
6 CHURCH ST, BAYSWATER VIC 3153 (NR MOUNTAIN HWY)
BANKCARD-MASTERCARD-VISA
FAX (03) 720 5280 man

-NEW ADDRESS-
(07) 397 3082 OR 397 7269
SHOP 3, 443 LOGAN RD, STONES CORNER BRIS, 4120
Prices subject to change w/o notice
FAX (07) 397 7269 man

Now, as promised, here are some questions.....

1. The feedline which would correctly match the impedance of a folded dipole is:
   (a) 50 ohm coaxial cable
   (b) 75 ohm coaxial cable
   (c) 90 ohm balanced line
   (d) 300 ohm balanced line

2. The voltage standing wave ratio for a properly matched transmission line is:
   (a) 0:1
   (b) 1:1
   (c) 10:1
   (d) 100:1

3. The resonant frequency of a half-wave dipole 0.30 metre long is:
   (a) 300 MHz
   (b) 400 MHz
   (c) 500 MHz
   (d) 600 MHz

4. Relative to a half-wave length in free space, the length of a practical half-wave antenna at the same frequency is:
   (a) the same length
   (b) slightly longer
   (c) slightly shorter
   (d) three-quarters of the length

5. A half-wave dipole antenna resonant at 28 MHz would have an approximate length of:
   (a) 5 metres
   (b) 10 metres
   (c) 38 metres
   (d) 56 metres

6. The current at the centre feed point of a half wave dipole is:
   (a) maximum
   (b) minimum
   (c) in-phase with the voltage
   (d) zero

7. The purpose of the folded dipole used as a driven element in a Yagi antenna is to:
   (a) increase the Q of the antenna
   (b) improve the directional gain of the antenna
   (c) increase the terminal impedance of the antenna
   (d) increase the effective height of the antenna

8. The impedance of an isolated centre-fed half-wave folded dipole is approximately:
   (a) 36 ohms
   (b) 50 ohms
   (c) 70 ohms
   (d) 300 ohms

9. An antenna which has an omni-directional radiation pattern is the:
   (a) quarter-wave ground plane
   (b) Yagi
   (c) log periodic
   (d) parabolic reflector

10. The quarter-wave ground-plane antenna is useful for high frequency DX work because it provides:
   a) uni-directional coverage
   (b) bi-directional coverage
   (c) low angle radiation
   (d) high angle radiation

ANSWERS
1 (d), 2 (b), 3 (b), 4 (b), 5 (a), 6 (b), 7 (c), 8 (d), 9 (a), 10 (c)

Cheers from Paul, VK3DBP.

QSL QSL QSL QSL QSL QSL QSL

If you haven't checked out what's available in QSL card designs from us for a few months we suggest that you do so. We have reintroduced white and colored gloss cards with a huge range of designs available at very affordable prices. Of course there are also inexpensive pre-printed cards, fully personalised and inexpensive matte finish cards — and if there's nothing to suit your taste in our range, we're more than happy to quote on whatever it is that you require. Our years of experience as a specialised producer of QSL cards means that we can produce cards at far lower cost than can your local 'quick-print' shop — if in doubt, obtain a price from one! We do all our own artwork and pre-press operation and you will save a mint on the artwork alone. Also, as we specialise in QSL cards, we buy our card stock in bulk rather than the very expensive way of buying in one-off quantity as is usually necessary with local print shops.

GREETINGS FROM AUSTRALIA
URCALL
OPERATOR: Your NAME
QTH: Where ever it is that you happen to live, Victoria, AUSTRALIA
EQUIPMENT : IC-751, TS-440S, AL811
ANTENNA (s) : 3 El Tribander, Dipole - 80m
DXCC
WAS
WAZ
WBC
CONFIRMING RECENT QSO WITH...
CALLSIGN | DAY | MONTH | YEAR | TIME (UTC) | FREQ | MODE | R | S | T
PROOF ONLY
PLEASE QSL
via BUREAU/DIRECT
THANKS QSL

In short, we're set up to give you the best design, the best quality card stock and the best-looking cards at the lowest-possible cost!
To obtain samples of both our cards and our designs, write to...

BINT SERVICES
PO Box 323, Cheltenham, Victoria 3192

Please enclose a 90 cent stamp for return postage.

QSL QSL QSL QSL QSL QSL QSL

DICK SMITH ELECTRONICS

MORE PEOPLE TURN TO US

uniden®

PRO-520XL DELUXE AM CB

From its sleek, black casing to its instant channel nine (emergency) switch and powerful 7-watt audio output, the Pro-520XL is a whole lot of transceiver for this low, low price! Featuring separate volume, squelch and RF gain controls, it's very easy to use. Also includes a noise limiter for reduced ignition noise, heavy duty mic, mobile mounting kit and public address facility (requires optional speaker).

Cat D-1235

uniden *2 Year Warranty!* **$139.95**

UNIDEN PRO 640 AM/SSB CB

The very best in Citizen Band radio! Uniden's stunning modern design with a Digital Bargraph meter for SWR, Signal and RF output, pushbutton selection for many features and individual illumination for every control. DOTC approved.

- Pushbutton control of noise limiter, SWR, PA facility, Hi-cut and RF attenuation
- Mic gain, Volume, Squelch and Clarifier controls
- LED bargraph meter for Signal, RF output and SWR
- Direct access to emergency channel 9
- High power 7 watt audio amplifier
- Includes mic, mounting hardware and instruction manual

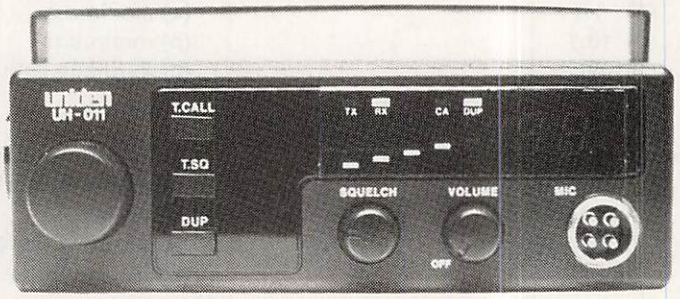
Cat D-1480

Bonus expires 31st May 1993

2 Year Warranty **$329**

EXCLUSIVE BONUS FOR CB ACTION READERS

Present this advertisement when you purchase a PRO 640 and receive a 5ft helical whip pack (Cat D-4076 valued at **$24.95**) at no extra cost.



UNIDEN UH-011 UHF CB

It's here! The new UH-011 follows on from the popular and reliable UH-001. You get the same high quality construction, plus a new improved front panel and handy signal strength meter. What's more, it retains all the best features of the UH-001, including repeater access facilites, Tx & Rx indicators, superb audio quality and a tone squelch option. With microphone and mounting kit.

Cat D-1766

uniden *2 Year Warranty* **$299**

Fits In Your Pocket

70 XLT SCANNER RADIO

Listen to the fascinating air waves around your city! This lightweight handheld VHF/UHF scanner has 20 memory channels, 8 band coverage (Covers 66-88, 136-174, 406-512MHz) and track tuning for improved performance. With rechargeable NiCad battery pack, AC charger and carry case.

Frequency Coverage: 66-88MHz
136-174MHz
406-512MHz

Sensitivity: 0.4uV 66-88MHz
0.5uV 136-174MHz
0.7uV 406-512MHz

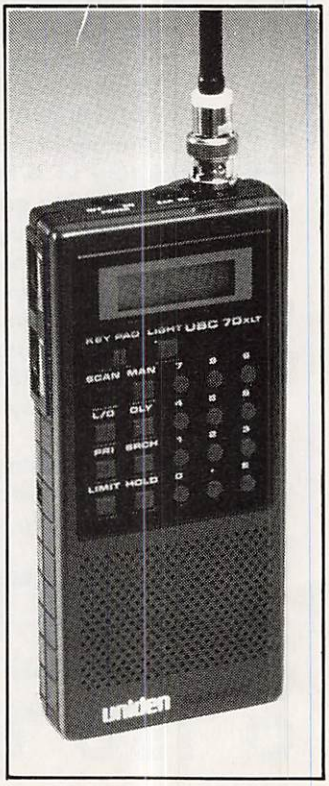
Cat D-2740

$269

2 Year Warranty

uniden

Exclusive to Dick Smith Electronics



YAESU FRG-9600 VHF/UHF SCANNER

This exceptional scanner has an impressive array of features and offers outstanding value for money. Frequency selection is by keypad or dial, with a variety of scanning modes and 100 memories provided.

It covers the complete 60 to 905MHz VHF/UHF spectrum in the FM, AM and CW modes and SSB to 460MHz. FM-wide covers FM radio and TV sound transmissions while FM-narrow covers commercial two-way communications - emergency services, police, business, UHF CB, military and amateur radio. Aircraft bands plus other amateur frequencies are accessed through the AM and SSB modes.

Specifications

Frequency:	60-905MHz continuous (up to 460MHz for SSB)
Sensitivity:	FM-n (12db SINAD) 0.5uV
	FM-w (12db SINAD) 1uV
	AM-n (10db S+N/N) 1uV
	SSB (15db S+N/N) 1uV
Tuning steps:	FM-n, AM-w 5/10/12.5/25kHz
	FM-w 100kHz
	AM-n, SSB 100Hz/1kHz
Voltage:	DC 12-15V

Cat D-2825

Only **$999**

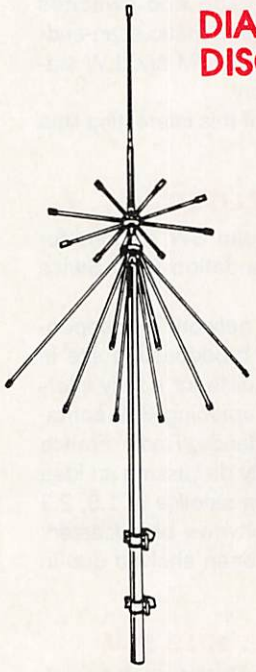
2 Year Warranty

YAESU

BONUS
Deluxe Scanner
Base Antenna
Cat D-4438
Valued at $69.95

Bonus expires 31st May 1993

PULL IN THAT SIGNAL!



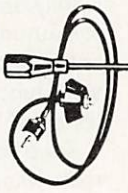
DIAMOND D-130J DISCONE ANTENNA

This quality Japanese discone antenna covers the frequency range 25-1300MHz and comes complete with mast mounting hardware and instructions. It's easy to assemble and install and has extensive stainless steel construction — making it extremely durable! Its wide frequency coverage makes it ideal for use with scanning receivers, as well as transmitters up to 200W P.E.P for the 6m, 2m, 70cm and 23cm amateur bands.

Cat D-4840

DIAMOND ANTENNA

$179.95



UHF CB 4dB ANTENNA PACK

MOBILE ONE

A high quality stainless steel 4dB antenna with UHF antenna base. It's exceptional value, durable and easy to install. Includes 3.6m of high quality Mil-Spec Coax, fitted with a PL-259 plug, and instructions.

Cat D-4000

5 year warranty

$29.95

1.5M HEAVY DUTY ANTENNA KIT

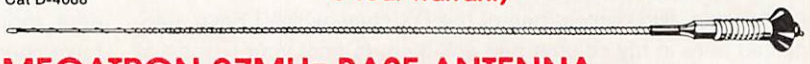
MOBILE ONE

A complete, heavy-duty 27MHz CB antenna kit in one pack! Comes with rugged 1.53m 'Superhelical' medium to long-range antenna, heavy-duty stainless spring and base with cable and plug. It's the economical way to buy!

Cat D-4088

5 Year Warranty

Only **$69.95**



MEGATRON 27MHz BASE ANTENNA

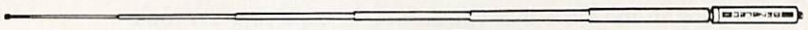
A superb 5.75m ground-independent 'no-tune' base station antenna from Benelec. It uses a matching network in a sealed, thick-walled base housing, giving excellent corrosion protection. It also allows high-power operation (up to 1000 watts) while maintaining low SWR across the band. High quality T81 grade aluminium tubing and stainless steel screws ensure excellent durability. The base section is water-sealed with a DC ground path for static reduction and an SO-239 socket for easy coax connection. Comes complete with mounting hardware for connection to your mast.

Cat D-4430

5 Year Warranty

$89.95

BENELEC



PHONE ORDERS: SYDNEY AREA 8882105
OUTSIDE SYDNEY (FREE CALL) 008 22 6610

FAX: (02) 805 1986 or write to DS XPRESS, PO BOX 321 N/RYDE NSW 2113
All Major Credit Cards Accepted. O/Nite Courier Available.

DICK SMITH ELECTRONICS

NSW • Albury **21 8399** • Bankstown Square **707 4888** • Blacktown **671 7722** • Brookvale **905 0441** • Bondi **387 1444** • Campbelltown **27 2199** • Chatswood Chase **411 1955** • Chullora **642 8922** • Gore Hill **439 5311** • Gosford **25 0235** • Hornsby **477 6633** • Hurstville **580 8622** • Kotara **56 2092** • Liverpool **600 9888** • Maitland **33 7866** • Miranda **525 2722** • Newcastle **61 1896** • North Ryde **878 3855** • North Sydney (Greenwood Plaza) **964 9467** • Orange **618 400** • Parramatta **689 2188** • Penrith **32 3400** • Railway Square **211 3777** • Sydney City **267 9111** • Tamworth **66 1711** • Wollongong **28 3800** **ACT** • Belconnen **(06) 253 1785** • Fyshwick **280 4944** **VIC** • Ballarat **31 5433** • Bendigo **43 0388** • Box Hill **890 0699** • Coburg **383 4455** • Dandenong **794 9377** • East Brighton **592 2366** • Essendon **379 7444** • Footscray **689 2055** • Frankston **783 9144** • Geelong **232 711** • Melbourne City 399 Elizabeth St **326 6088** & 246 Bourke St **639 0396** • Richmond **428 1614** • Ringwood **879 5338** • Springvale **547 0522** **QLD** • Booval **282 6200** • Brisbane City **229 9377** • Buranda **391 6233** • Cairns **311 515** • Capalaba **245 2870** • Chermside **359 6255** • Maroochydore **791 800** • Rockhampton **27 9644** • Southport **32 9033** • Toowoomba **38 4300** • Townsville **72 5722** • Underwood **341 0844** • **SA** • Adelaide City **232 1200** • Beverley **347 1900** • Elizabeth **255 6099** • Enfield **260 6088** • St. Marys **277 8977** **WA** • Cannington **451 8666** • Fremantle **335 9733** • Perth City **481 3261** • Midland **250 1460** • Northbridge **328 6944** **TAS** • Hobart **31 0800** • Launceston **344 555** **NT** • Darwin **81 1977** **STORES ACROSS AUSTRALIA AND NEW ZEALAND**

DX Logbook

By Rob Williams

Welcome back! The warmer months are behind us now and our indoor DX activities will be picking up. There is a lot of info in store in this edition so let's get into it. Remember, this column is devoted to the shortwave broadcast bands - the bands of frequencies between 3 and 30 MHz; all times are in UTC/GMT, and all frequencies are in KHz unless stated otherwise.

MAIL CALL

There seem to be many DXers out there who have purchased second-hand receivers which didn't come with a manual. Mail in the last few months has come from several people who need to find out about their new pride and joy. Michael Hogan has a Sony ICF2001 and is interested in finding out how to use his radio. He says this gets him so frustrated that "at times I would love to place a 12 gauge at about 12 inches away from it..." - I think you get the picture! If anyone can help this desperate DXer out please drop me a letter and I'll pass on your address to him.

WHAT TO DO WHEN ALL ELSE FAILS

If you do buy or are given a shortwave radio, but the previous owner doesn't have the manual, then what can you do?

First of all try to contact the manufacturer of the radio.

If they have an address here in Australia start there, however, you may be referred to a head office, which in many cases is in Japan.

This is still worth a try - big receiver manufactures have staff who answer correspondence in many languages from around the world and will try and help you.

You can also contact one of the DX clubs which I have mentioned here in my column and ask them to print your request in their club newsletter. If you have access to a modem and computer, try calling one of the many radio BBSs that are around and leaving a message either on the OzRadio (shortwave) forum or the international shortwave echo.

You'll be surprised who reads the electronic mail and owns a radio or two. As a last resort, you can write to me and I'll ask for assistance through this column. On the same subject, another piece of info which came across my desk last month is news of a company in the USA that specialises in supplying old radio manuals. The company is *Hi Manuals, PO Box 802, Council Bluffs, IA, 51502-0802.* They have a catalogue for $US2.00 (add a bit more for postage) which may get you out of a bind.

HELP DESK

Terry Gilroy from Queensland has written in asking for assistance on the SX-190 receiver. While not an expert on this radio I sent out an SOS on the FidoNet BBS network and received a reply from Clive Campbell.

Terry wants to know what the standby jack on the receiver is used for. Well Terry, if you have a ham transmitter this jack allows you to connect the two so the receiver will automatically be muted when you hit the transmitter's PTT key. This prevents your signal from blowing up your radio!

The SX-190s VFO and HFO outputs are also used to control an external transceiver.

RECEIVER REVIEWS ON-AIR

Famous shortwave voice, Ian McFarland, is due to finish his stint with NHK at the end of March and will be returning to Canada where, in conjunction with Larry Magne, he will be reporting the latest trends in receivers as well as providing shortwave receiver tests. Their segment was very popular when it ran over RCI and later on NHK's DX programs.

This new segment will be aired on the last Sunday of each month on NHK's Media Roundup.

NEW SW SET FROM SANGEAN

Sangean has released the ATS-606P, a compact multi-band portable aimed at the international traveller who enjoys listening to the AM, FM, SW and LW bands.

Sangean has taken some novel steps to make a radio which is truly designed for the traveller. The supplied AC power adaptor automatically senses the supply voltage and switches between 110 or 240 volts, while a unique automatic scan-and-store function searches for the strongest MW, FM and LW stations and loads these into the 606P's memory.

Keep your eyes on CBA for a full review of this interesting little radio when it arrives on our shores.

SHORTWAVE VS SATELLITES

Satellites may soon be used by European SW stations for international broadcasting, if a recommendation from Swiss Radio International is successful.

SRI have proposed that the continent's network of independent shortwave broadcasters form a joint broadcasting site in Luxemburg and beam their signals to a satellite for a truly international audience, with the intention of replacing SW somewhere down the track. BBC, Radio Netherlands, Radio France International and Germany's DW are already discussing an idea to use Digital Audio Broadcasting (DAB) via satellite at 1.5, 2.3 and 2.6 GHz, while ITU plans to move shortwave broadcasters to single sideband by the year 2015 have been shelved due in part to advances in DAB technology.

BILL AND HILARY'S BUDGET HITS SW

President Clinton plans to reduce the budget for US broadcaster RFE/RL by $US60 million in 1994, $US59 million in 1995 and $US281 million in 1996.

Because RFE/RL cost $207 million to run last financial year, this type of cut-back will see the end of RFE/RL - so if you haven't verified them yet, you better hurry before they go.

At the same time, the moves to establish Radio Free Asia continue - it will be interesting to see the final outcome.

NEW CATALOGUE AVAILABLE FROM UNIVERSAL RADIO

Australian DXers have access to many different stores and radio specialists shops selling a wide range of radio gear. Unfortunately we simply don't have the massive DX population of the US which supports shops that exist solely for the short-

wave hobbyist. Shortwave gear sold here in Australia is just a sideline alongside (or more often behind) ham gear.

This is where companies like Universal Radio can help.

Universal is one of the world's largest shortwave specialists, and has built up a large mail-order business supplying DXers around the world.

And for those of us who don't have a shortwave supermarket around the corner, the Universal catalogue is as essential as CBA or the WRTH! Universal Radio's latest catalogue is more like a book - 100 pages of receivers, decoders, frequency counters, antennas, books, RTTY and fax equipment.

They do all modes and all bands, right up to satellite comms, and if you are finding it hard to buy that special something for your shack, then I'm sure Universal will have it.

Just window shopping through the pages is enough to make you drool. You can get it airmailed to you for just three IRCs by writing to Universal Radio, 6830 Americana Parkway, Reynoldsburg, OH 43068 USA - and tell 'em you read about it in CB Action!

RADIO KOREA MOVES INTO EUROPE

As of May this year, Radio Korea will be using BBS transmitter facilities to expand it's European coverage. Korean, English, French and German will originate from transmitters at Skelton, while the BBC will be using transmitters at Radio Korea's Kimjae, South Korea, site to extend its reception into China.

The BBC will be broadcasting in English, Mandarin and Cantonese. This is a good chance to QSL Skelton, so once the schedule is announced I'll publish it here. By the way, 1993 is the 40th anniversary of Radio Korea, so watch out for any special commemorative QSL cards...

NEW SKED FROM KSDA

Here's the latest sked for US religious broadcaster KSDA for the Z-93 period (28/3-26/9): 9495 from 1900-2200; 9530 from 1000-1100; 9650 from 1300-1400; 11980 from 0900-1700; 13720 from 0200-2300; 15225 from 2200-0900; 15310 from 2000-2200, and 15610 from 2300-0200.

OUR DIGGER DXERS IN SOMALIA

Australia's military contingent in Somalia has become the latest convert to the hobby, following the Australian Armed Forces' AAFR broadcasts to the region from the Department of Defence studios in Canberra.

AAFR has been transmitting from one of Radio Australia's 250 kW Darwin transmitters for some months and is providing an excellent signal around Australia, with many highly-prized QSLs now decorating shacks and brag books around the country.

While the verification is only a photocopied piece of paper with hand-written details, it will rank high among DXer's collections when our involvement in Somalia ends and the broadcasts disappear. For the M93 period the broadcast goes out between 0300 and 0400 daily on 17900.

Reports can be sent to Lt. Kerry Martin, Australian Armed Forces Radio, B/4/22/N, Russell Offices, Canberra ACT 2600, enclosing a self-addressed envelope for reply. There is also talk of a similar broadcast to our military personnel in Cambodia. And that's all I have for you this time around.

If you have any problems with your shortwave DXing or wish to pass on some DX info for others, then drop me a letter (with SSAE for reply) to PO Box 108, Minto NSW 2566

DX TIPS

**** Although Austrian program Shortwave Panorama has ended, tune to Saturday evening's "Report to Austria" program for Wolf Harranth's DX tips - their current sked to Australia is 0830 on 1540 and 21490.***

**** VOA's new relay at Udorn, Thailand, has began test transmissions, and Glenn Hauser reports hearing VOA's test sked of 1100-1400 on 11785, 1400-1500 on 9615, 1500-1700 on 9680 and 2100-2300 on 6045, carrying Chinese programming.***

**** Thailand's international SW service is hard to hear at the best of times, so the opening of this new relay station gives DXers a good opportunity to log this country.***

**** Most SSB transmissions from VOA's relay station at Bethany have been dropped, except for the relay in German to Europe from 2200-2230 on 10869. This frequency doesn't appear in the current sked I have for VOA, so it may be worthwhile checking this one out.***

**** The latest Radio Netherlands sked has English broadcasts from their CIS transmitters at 0030 on 9825(A), 0130 and 0230 on 12025(A) and 0930 and 1030 on both 5470(I) and 12065(P). Those letters following the frequency indicate the individual CIS transmitter sites - Alma Ata, Irkutsk and Petropavlovsk Kamchatski. RN is also hoping to establish a computer BBS for DXers and distributing their news magazine "On-Target" electronically around the world.***

**** Due to a production error, part of the 60 metre band was omitted from the 1993 WRTH. If you own a copy and would like the missing info, just write to me with a SSAE and I'll post the info to you.***

**** Respected Australian DX club, OZ-DX, tells me it is taking steps to have its info-packed magazine available electronically for anyone who wishes to download it from a BBS. This is a world-first for the group.***

While there are fortnightly editions of Sweden Calling DXers and the Radio Netherlands newsletter, this is the first shortwave DX club to produce an "electronic edition" of their newsletter for public use - well done, guys!

I hope to have more news on this great innovation next issue.

SPR SNIPER VERTICAL BASE STATION ANTENNA

THE ONLY BASE ANTENNA EVER RATED BETTER THAN "TEN-OUT-OF-TEN" BY CB ACTION !

$75 including Air Express ! (Get in quick ! Limited stocks at this price !)

SPR STARDUSTER YAGI BEAMS

3-ELEMENT ... **$130** 4-ELEMENT ... **$160** 5-ELEMENT ... **$190** 6-ELEMENT ... **$220**

($40 insured freight .... delivered right to your door.)

SCANTENNA - XLR 16-ELEMENT DISCONE (25-1300 MHz)

Get the best out of your scanner ! **$160 including Air Express!**

UHF CB ... 27MHz CB ... SCANNERS ... ACCESSORIES

Check out these inflation-beating prices!

ELECTROPHONE TX-4000 UHF	$435.00	COBRA 146-GTL SSB/AM	$275.00
27 MHz AM CBS FROM	$65.00	AR-1500 0.5-1300 MHz SCANNER .	$670.00

($15 Insured Air Express on CBs/Scanners/etc)

DM-453 MOBILE POWER MIKE	$27.50	20Db VARIABLE RECEIVE PRE-AMP	$45.00
COMPACT VSWR/PWR METER	$25.00	3-WAY ROTARY ANTENNA SWITCH	$17.50
SWR/PWR METER (10/100w)	$35.00	PA SPEAKER	$17.50
SWR/PWR METER/ANTENNA TUNER	$45.00	MINI EXTENSION SPEAKER	$10.00

(4.50 P&P on meters/switches/speakers/etc)

1993 "ESG" QUEENSLAND SCANNER FREQUENCY REGISTER ..... $32 INCLUDING POSTAGE !

SSB ENGINEERING ... VOLUME 1 Covers crystal switching methods, synthesized rigs, and early PLL rigs. The mountain of slide information makes this book a classic. Price $15, $1.50, P&P

SSB ENGINEERING ... VOLUME 2 Covers "second generation" PLL rigs, has updated information on many of the oldest rigs and includes some build-it-yourself test equipment projects. Price $17.50, $1.50 P&P

SSB ENGINEERING ... VOLUME 3 Covers the latest PLL-ICs, has a ham radio modification section and an AM to FM CB conversion section. Price $20, $1.50 P&P

THE CB MODIFICATION HANDBOOK covers Australia's most common CB radios. Everything from a few extra channels to full house conversions covering hundreds of channels. 5 kHz steps, increasing power, slides etc. Price $15. $1.50 P&P

THE CB PLL DATA BOOK is the CB modifier's Bible. This all-new international edition covers fifty specific phase-locked loop ICs, with manufacturers' cross-references. Price $15, $1.50 P&P

THE SCREWDRIVER EXPERT'S GUIDE will enable the average non-technical CBer to locate and repair up to 95% of CB radio problems, as well as helping the advanced hobbyist to tune and modify his equipment for improved performance. Price $15, $1.50 P&P

CB ANTENNA CONSTRUCTION, illustrated plans for quarter-wave and half-wave groundplanes, two-element quad, three-element beam and high-performance stacked beams. Price $3 including postage.

HAM AND CB ANTENNA DIMENSIONS 130 charts covering dipoles, beams, quads, vees, triangles and verticals. An essential reference work for any serious antenna builder, this book covers the CB band, HF bands from 160 metres to 10 metres and the 2 and 6 metre bands. Price $15, $1.50 P&P

BANKCARD ... VISA... MASTERCARD...WELCOME BY PHONE OR MAIL ($25 MINIMUM)

MAIL ENQUIRIES ... PLEASE INCLUDE A STAMPED SELF-ADDRESSED ENVELOPE

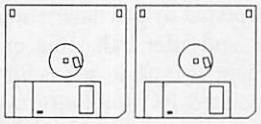
SOUTH PACIFIC RADIO

6 SYLVAN COURT
KALLANGUR
PHONE (07) 204 5000

MAIL ORDER DEPT-
PO BOX 29, KALLANGUR,
QUEENSLAND, 4503

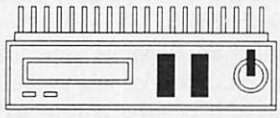
SCANNER FREQUENCY DATA BASE FOR IBM COMPATABLES with HDD.
Comes complete with FREE Data Base Management program. Search by Name, Callsign, Frequency & Location. Available for individual States – Multiple States & National Data Base. Basic format supplies e.g. NSW – VHF & UHF etc..
National HF List requires HDD space of 7megabytes for nearly 40,000 indexed records.
$45.00
Nominate FDD type with order. E.g., 3.5 inch 1.44M

$29.00 per set. P&P $5



PREFORMATTED 1.44M FLOPPY DISKS High Density packaged in boxes of 10 discs ready to use. IBM Format.

$15.00 per pack $5 P&P
Limited Offer



AMATEUR RF POWER AMPS TO COVER 3 to 30MHz
Complete with high gain pre-amplifiers for improved receive performance. NOT legal for CB.

TX2250 180W	$229
TX5500 350W+	$385
CVS 50 30W	$175

Plus $15 P&P

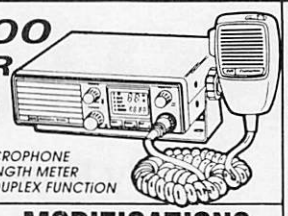
WANTED

Why not convert your unused CB, Scanner or other communications equipment into CASH? Top prices paid for good, clean rigs – some even if they don't work. Ring or call-in for a valuation. Licensed Secondhand Dealers and Pawnbrokers. mbn159/60

POWER BAND COMMUNICATIONS

MELBOURNE OFFICE
1289 Nepean Hwy,
CHELTENHAM, Vic 3192
(Opposite Cheltenham Police Station)
Phone (03) 584 7631
Fax (03) 583 0846
Melway Ref 86 J1

GME Electrophone TX4000 UHF TRANSCEIVER



- *INTEGRATED SEL-CALL*
- *HIGH SPEED PROGRAMMABLE SCANNING*
- *REMOTE OR DASH MOUNTED OPTIONS*
- *LIQUID CRYSTAL DISPLAY*
- *FRONT MOUNTED SPEAKER*
- *ELECTRET MICROPHONE*
- *SIGNAL STRENGTH METER*
- *SELECTABLE DUPLEX FUNCTION*

$RING

ICOM IC-40G

SAVE SAVE SAVE SAVE

Which heavy duty battery pack BP 7 or CM 96 supplied standard with **IC-40G**
BP-7 13.2V high power 450 mAH CM-96 8.4V long life 1200 mAH

Plus all the usual features:
- ★ 5 watts output
- ★ 12 user prog. memories
- ★ mem scan or all chan. scan
- ★ power saver feature
- ★ prog. time out timer
- ★ dual watch feature
- ★ LCD dial lamp & dial lock
- ★ high or low power switch
- ★ splash resistant etc.

$599 plus $15 P&P

REPAIRS — SERVICE — MODIFICATIONS

Have your 27MHz or UHF rig expertly repaired and aligned using the latest Hi-Tec IFR and Hewlett Packard diagnostic equipment. Work is carried out on the premises at both our locations by qualified staff. Your valuable equipment is NOT sub-let out to other repairers.

SCANNER FANATICS '93 FREQUENCY REGISTERS
Vic. N.S.W Qld. W.A.
$25.00 Post & Pack $3.50

NEW SERIES ADAPTOR (SA)

Add versatility to your system. Convert your SO-239 (co-ax mount) UHF mount to take 5/16" series UHF and 27MHz antennas
$10 plus $2 P&P

Trade-in Your Old Rig NOW.

$99 $89 $79 PB1000 & New PB-750 PB-600

The Power Band family of high performance UHF CB base antennas employ high quality professional grade components and long life construction. PB-1000, 750 and 600 (Mini-Six) are all compound antennas using multiple, velocity compensated half wave elements co-phased for optimum, low angle radiation. The high density Australian fabricated, tapered wall thickness radome yields high strength, good rigidity and light weight. The elements are safely suspended in inert, elesticised, polyurethane foam for extra strength and weather resistance. Low flex characteristics of these antennas greatly reduces 'fade & flutter' under windy conditions. The active elements are DC grounded for static charge protection and minimum rain noise.

Post & Pack $15

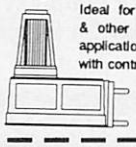
SCANNERS

Uniden 100XLT	$329
Uniden 200XLT	$429
Uniden 760XLT	$429
Icom R-100	$950
Icom R-1	$650

* Icom R-1 limited offer for April/May '93 only.

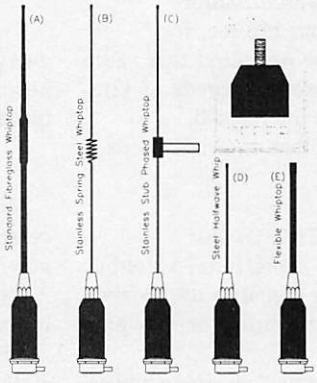
PHONE ORDERS
It's easy to order by phone! Just phone with your credit card details and we'll do the rest. C.O.D. is OK too. Call (03) 584 7631. Most orders despatched within 24 hours.

Light-Medium Duty ROTATOR



Ideal for UHF beams & other medium duty applications. Comes with controller etc..
$135
$18 P&P

Post & Pack.... $7.50



BONUS OFFER... For this CBA issue only we offer a BONUS FREE Series Adaptor with every PB-60 sold – any whiptop combination. Also 3m of RG-58 co-ax & PL259. Series Adaptor converts the SO239 mount to a standard CB whip mount. Use as a weather cap too.

(A) $69 (B) $69 (C) $72 (D) $45 (E) $48

PB-60 SYSTEM Two New Whips

Additional to the standard PB-60 'System' antenna range for UHF CB are two new high gain whip choices that expand the versatility of this popular product line. Item (B) is a tough, stainless spring steel whip that will take a real 'hiding' and still spring back for more.
Item (C) is also made from durable spring steel but uses a real phasing 'stub' for greatest efficiency. When used for mobile work the stub direction can be adjusted to 'trailing' mode operation for balance and minimum wind resistance.

Car Phones Competitive prices on most popular brands – NEC UNIDEN MOTOROLA NOKIA etc. High gain antennas, on-glass, elevated feed, specials & more. RING.

MAIL ORDER FORM

Send to **POWER BAND COMMUNICATIONS 1289 Nepean Highway, Cheltenham 3192**

Please rush me the following item/s.

.....

.....

.....

.....

.....

.....

NOTE:—
Please include phone number so we can advise of any difficulty with processing your order. Australia Post will not accept some large items and alternate transport must be arranged. P.O. Box & R.S.D., etc. delivery addresses are not acceptable to private freight companies.

I enclose Cheque/Money Order
Please debit my Credit Card VISA ☐ BANKCARD ☐ MASTERCARD ☐ Please send goods COD ☐
ALL Orders must include phone number for confirmation.

Phone ( ) .....

Signature .....

Expiry Date .....

Name.....

Address .....

..... P/code .....

PRODUCT REVIEW

JEBSEE ANTENNA ROTATOR

By Russell Bryant

Like listening to places far away? Use a directional antenna, such as a yagi or log periodic? Would you like to get more out of your antenna setup? Thought about a rotator? These and other questions will be answered shortly.

Atmospherics aside, radio frequency signals travel well beyond their intended areas.

Even so, they are not always able to be heard because the signal is not strong enough to open the squelch of the scanner.

As most scanner users have discone antennas which exhibit as much gain as your big toe, it cannot normally be expected that radio signals that originated hundreds of kilometres away will be intercepted.

So the first thing that an aerial needs is gain.

YOU NEED GAIN!

High gain omni directionai antennae will deliver a better signal to the receiver when compared with unity or low gain radiating elements.

However, because the `receiving power' of a omni-directional antenna is just that, from all directions, it, too, has limitations. The second criteria is that the antenna must be directional.

Basically two aerials fit into the `directional' category...a Yagi and the under appreciated log periodic.

Both have high gain figures and are directional, however, both have a drawback.

The one characteristic that makes the directional antenna what it is can often work against the scanner enthusiast.

Mounted atop a mast, the log or Yagi points in one direction and one direction only.

The highest percentage of their receiving lobe is to the front of the aerial, sometimes cutting out any signal not within that frontal lobe.

Unless you have a desire to listen in on services from one area, or climb your mast every time the need arises to tune into a new precinct, some form of mechanical turning device is a must.

ENTER THE ROTATOR

Most of my scanning these days concentrates on the railways...so what else is new?

Railways operate over a wide area and in a variety of compass bearings.

I like to monitor trains in the Hunter Valley, to the north, as well as locomotives working the BHP Steel plant in Port Kembla to the south. As most of the rail frequencies are simplex, not worked through a repeater, a log periodic is the only way I get to hear more than local traffic.

Link my listening habits with the type of antenna I use, throw in a measure of impracticability in climbing the mast every hour or so, and you have the right mix for a rotator.

When the Hatadi Pearce Simpson rotator arrived I must admit I was surprised at just how simple the device was, and after balancing on a ladder for the hour it took to get it up in the air, I appreciated its simplicity even more.

Let's point you in the right direction from this inexpensive little antenna rotator from Hatadai.

Basically the Jebsee comes in two parts, the control unit, which is installed inside the shack, and the drive unit, which is stuck on top of the mast.

Joining the control and motor units together is a length of three core cable (which is not supplied).

I used a quantity of telephone cable that was laying around, it works just as well, however, because it is solid core it will break more easily than multicore.

EVERYTHING WORKED WELL

With the motor unit sitting on my bench, I connected a short run of cable to it from the controller, just to test for synchronisation between the control motor and drive motor.

Everything worked well, so it was up the ladder with shifting spanner in hand.

The motor unit is secured to the mast by two cross brackets held in place by four self locking nuts.

A vertical length of pipe is slid into the rotating sleeve on top of the motor drive and from there the log periodic is mounted on a horizontal arm, ensuring enough cable is hanging free to allow a full 360 degree turn.

I decided on PVC pipe to insulate the aerial from the drive, this helps alleviate weight problems and static electricity build up.

CONNECTION IS EASY

The control cable and RF coaxial cable were secured to the mast using cable ties, so as to reduce the gravitational drag on all cable connections. Once inside, all connections are as easy as 1, 2, 3.

On the rear of the controller are three screws labelled 1, 2, 3.

They correspond with three screws on the underside of the motor drive, also designated 1, 2, 3.

The cable used had six different coloured wires and I choose black, red and white. Black was hooked to 1, red to 2 and white to 3. If you forget the colour sequence, just remember alphabetical B to 1, R to 2 and W to 3.

The co-ax was connected to the scanner, and I was in business.

When I installed the log periodic on the rotator I checked to make sure it was pointing as near to north as was possible. A compass is handy here to establish direction.

As my listening pattern is from the north, through east to the south, I determined that the front of the aerial should follow that path, it did, so a job well done.

Using a map, I plotted the headings for the principal towns surrounding my location.

Overlaying the map onto the Jebsee's controller, I placed small removable stickers around the controller's compass points. Each sticker was then labelled with the towns, such as Singleton, Newcastle, Wollongong, Nowra, Goulburn and so on. This made it easy to work out the location of lesser towns in between, should the need arise.

NO, THE DOPPLER METHOD IS NOT RELATED TO BIRTH CONTROL

While I labelled townships, you may wish to tag users and the best way to log radio services is to employ the Doppler method. For those who don't know, Doppler is best described as a train approaching a level crossing.

The bells get louder the closer the train gets. When actually on the level crossing the bells are the strongest and as the train passes the bells they loose intensity.

If you roughly know the location of the transmitter that you wish to monitor, turn the dial 20 degrees either side of the location, somewhere in the middle of the sweep is the loudest signal.

EASY TO REALIGN

Rotators like the Hatadi Jebsee rarely get out of sync.

If they do, a simple method to re-align them is to turn the knob fully clockwise against the north stop and wait for the indicator to rotate to that position.

When the dot stops, rotate the dial counter clockwise, fully back against the north stop.

When the red indicator dot reaches the top, the controller and motor drive are re-sychronised.

To the serious scanner user, directional antennas are to best way to monitor radio services located beyond your local area.

To get the most from that type of aerial, you need to be able to move it from place to place.

A rotator such as the Hatadi Jebsee is the only practical method and, as it turned out, also the cheapest way of doing it.

The Jebsee retails for under $150 and is available from Hatadi stockists and dealers across the country.

SPECIAL

LESON DESK MICROPHONE

Leson Desk Microphone wired to your particular radio

ONLY **$99** complete

We will send mail orders anywhere in Australia . . Please add $10 for P&P. We also stock other quality Pearce-Simpson products — Super Lion, Super Tiger, Super Cheetah, Super Panther, ST-901, AM-810 & many more.

Time Plus P/L

55 SYDNEY RD., BRUNSWICK 3056

PH: (03) 380 4172, (03) 387 4942

TIME FOR CHANGE - BUT A CHANGE FOR THE BETTER?

SPECTRUM MANAGEMENT - NEW DIRECTIONS

We are all users of the frequency spectrum. You might not own a two-way radio or a mobile phone, but each day without even thinking about it you are using the spectrum.

It's there on demand, 24 hours a day.

Without it our lives would change - no evening news, no daily dose of soapies, no movie thrillers. And who doesn't wake up to their favourite radio station each morning?

We live in an ordered society, one where valuable resources need to be shared and managed.

Yet this same world sees technology placing an ever-increasing demand on frequencies.

Since the first transmission, governments and later industry throughout the world envisaged various uses for radio, including military and commercial applications.

In the middle of all this, the spectrum remains a uniquely finite resource - it can't be exhausted like gas or coal, but it can only be employed by a limited number of users at any one time.

BACKGROUND

The radio spectrum is currently defined as being between 3 kHz and 300 GHz.

Each portion has unique properties - the shortwave bands permit world-wide communications, while higher frequencies are line of sight and others still can be heavily attenuated by rain.

As we learn more about the spectrum and as technology improves, increasing strain will be placed on this rich resource.

In the early days, the then PMG regulated the spectrum to ensure that all who used it could work in harmony.

If there was interference a radio inspector or RI would answer your complaint, find the cause and where possible restore law and order.

They were, in effect, the "police of the airways". But as the march of technology continued, more and more pressure was applied. Technology restricted access to the spectrum we cherished so much. An unstoppable demand for spectrum required frequencies to be shared, so tighter regulations and stricter specifications on equipment were needed. When the PMG was split into entities responsible for post, telecommunications and radio, the government saw the need to maintain an orderly approach to this resource and at the same time ensure regulations could keep up with technological changes.

As you will read elsewhere in this issue, there are massive changes about to take place as to how the frequency spectrum is to be utilised during the coming years. Rob Williams tells you how, when and what...

...AND SO CAME DEMAND

The Department of Transport and Communications evolved out of these needs.

As new communication modes developed, users began to see the potential available to them.

Businesses increased efficiency by having instant communications with their fleet of cars or trucks.

The majority of radio communications is done using analog technology, and although still common it is being replaced with digital modes.

Even now, we have mobile data terminals in cabs, courier vehicles and other fleets.

Voice encryption has arrived, mobile phones have begun to become the norm, and still technology rolls forward.

Engineers plan for high definition TV and satellite broadcasts have become a daily event.

ACCESS CAN NO LONGER BE GUARANTEED

We have reached a point where access to this finite resource cannot be guaranteed, so the government has embarked on a course of radical changes to the way Australia manages its slice of the spectrum.

Spectrum planning occurs both nationally and internationally, so before changes can be made we must first ensure that neighbouring countries will not suffer - without this cooperation our spectrum would be in a shambles.

Through the ITU, an agency of the United Nations, representatives from DoTaC express the views of Australian spectrum users and the Government to ensure we have equal access.

DoTaC currently performs the roles of

planning, cost and assignment of licencing, frequency assignment, provisioning of technical standards and equipment approval.

To give you an idea of how big the job is that DoTaC have to deal with, in 1992 there were 1.29 million licenses issued raising some $72.29 million.

The use of computer databases has helped DoTaC to keep track of who used what and where, but the demand for new frequencies and new services just won't go away.

A NEW ERA IS ABOUT TO BEGIN

For many years, spectrum space has been allocated on a "first come first served" basis. But new recommendations from a House of Representatives standing committee has set the stage for major reforms for spectrum management in Australia.

ENTER THE SMA

The Spectrum Management Agency or SMA is a new arm of DoTaC, charged with overseeing the management of Australia's frequency spectrum, based on a more market-oriented "user-pays" system.

From an administration viewpoint, the SMA will be a statutory agency formed from staff within the present radiocommunications division of DoTaC.

Those 400-odd people who currently handle spectrum management will be transferred to the SMA.

The new legislation will include a set of objectives which will be a guide as to how the agency will operatc, while in 1995 an industry commission will conduct a review of the SMA to ensure that goals have been met.

Licenses will be issued for up to 10 years, rather than the current 12-month period, with the licencees permitted to buy, sell or lease their segments of the spectrum.

NO AUTOMATIC RIGHT OF RENEWAL

Spectrum licenses will be made available either by auction or tender, with no automatic right of renewal.

Frequency coordination will be carried out through other commercial organisations along with yet undefined services.

Public sector groups will participate in auditing of the spectrum but at the moment it is unclear how this will be implemented.

Industry will also increase its involvement in the establishment of technical standards and type testing of radio communications apparatus.

I'VE HEARD THIS SONG BEFORE..

The current computer-based frequency management system known as SMIS will be replaced by RADCOM, an on-line database containing licenses and frequency assignments which will be available to the general public.

Some of this I've heard before - let's wait and see how much data will be made available and how accurate it will be.

Previously SMIS information has been made available on micro-fiche or magnetic computer tapes, with so-called "sensitive" data removed.

Their interpretation of "sensitive" is very wide, making a mockery of what information is available to the public.

The new register of radiocommunications licenses contains a clause giving the SMA the power to delete parts of the register where the SMA feels the release of that information would not be in the public interest.

LICENCE/PRICING CHANGES

There will also be changes to the types of licenses and pricing, which can currently be quite confusing. The public will soon be asked by the SMA to comment on changes in this area.

The new Radiocommunications Bill comes into effect on 1 July this year, with some exemptions to the Department of Defence, ASIO and ASIS.

The usual penalty clauses have been included, giving the SMA the standard powers to search and seize illegal transmitters anywhere in Australian territories.

Initially the SMA will examine spectrum space which is in high commercial demand.

New "spectrum licenses" will replace the current apparatus-oriented licenses, defining a range of frequencies and a geographical location without equipment restrictions.

This will allow the user to change transmission mode and the way they use the channel within the license guidelines; to combine, split, trade or even mortgage spectrum licenses, and allow third party use of their frequencies.

CERTIFICATES OF COMPLIANCE

We will also see non-Government agencies being accredited to issue certificates of compliance, thus reducing the DoTaC's current workload.

Spectrum licensees will be able to initiate civil action in the Federal court against harmful interference and the SMA will be able to appoint conciliators to deal with disputes.

Another improvement to frequency management will be the appointment of agencies such as banks and post offices to accept license renewals.

New standards will be in place to reduce interference and this will include receivers - I wonder if CBers will at last be free from TVI complaints, as this can only really happen with changes to TV receiver technical standards.

The license fees themselves will include a one-off "access fee" based on the value of the frequency, an annual "overhead" charge to cover the SMA's costs, and a "service charge" imposed by the SMA for specific services.

There will also be a once-only conversion fee when the license is moved from an apparatus-base to a spectrum-base.

Quasi-commercial Government bodies will pay market prices for their spectrum licenses. Organisations like AOTC and Aviation are heavy users of spectrum and will have to re-assess their current allocations and practices to ensure their spectrum allocations are being used economically.

THE OVERSEAS EXPERIENCE

Spectrum management in the United Kingdom is under the control of several Government bodies depending on the use of the spectrum.

This has meant a large amount of red tape, so reform is underway to allow private Frequency Planning Organisations (FPO) to administer parts of the spectrum and approve licencing.

New Zealand's liberal approach to the sale of spectrum space in 1989 has seen radio frequencies for broadcasting and telecommunications sold to anyone prepared to pay for it.

They have however stopped short of allowing people to buy up massive chunks of spectrum and obtain an effective monopoly on that band. The US holds lengthy hearings before a frequency is made available and then allocates it on a "lottery" system, although a review of this process is underway with a proposal to give the FCC the appropriate spectrum management authority.

...continued on page 45

KYLE COMMUNICATIONS

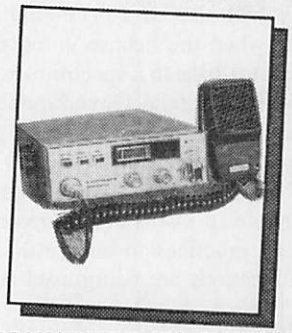
*** Service specialists in all CB's 27MHz and UHF * QLD'S Largest repairer of Amateur equipment**
*** CB and Commercial Repeaters * Voice idents and repeater controllers**

AUTHORISED ICOM DEALER

All Icom equipment sold by us are AUSTRALIAN models and are backed by Icom in Australia.

IC-R1 100KHz to 1300MHz.....$675
SSB mod for IC-R100 fitted and tested. $225
IC-R9000 100KHz to 2000MHz.....$7100
AH-7000 discone 25 to 1300MHz.....$229
Please call us for any Icom accessory

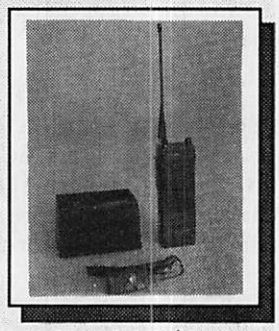
IC-R100 100KHz to 1856MHz.....$925
IC-R7100 25MHz to 2000MHz $2100
IC-R72A 100KHz to 30MHz..... $1599
IC-40G UHF handheld c/w BP7
orCM96 battery pack.....$649



COMMEX UHF CB's BUSHRANGER c/w 12/24 volt DC Convt $279

BUSHRANGER MK 2 10 pos multicall selcall, opt DC convt $295

EXECUTIVE 9 mem ch, keypad multicall, selcall selection, scan, LCD $380



JACKAROO H/H .25/2.5 watt, carrycase charger $450

STOP TELEVISION INTERFERENCE NOW WITH SPECTRUM TECHNOLOGY FILTERS
HP75BB Highpass filter and braidbreaker in one package.....$25 $2.50 post and pack
NF75 Notch filter for pager, amateur, commercial quote freq...$35 $2.50 post and pack

**** NEW ****
GME TX4000.....$440
Built-in selcall, paging, alarm input, remote control output & much more

GME TX4000R **$535**
Ranger RCI 2950 **$499**
***** Uniden UH-055** scanning H/H **$475** Philips FM 650D **$419**
**** Sawtron** 999 **$745** * KG107 **$1085** * KG109 **$1285**
Scramblers ** ST-20** voice inversion reasonable security fitted **$155**
ST-25 Voice Encryption high Security Fitted **$299**
Signal Meter Kits for all UHF CB's pcb built and tested **$50**
VCO Blocks to suit A and B Cybernet radios as well as Lion ans Tomcats **$40**
Splitter Combiners phase your antennas together 2-WAY **$75** * 4-WAY **$105**
UHF CB Yagi 17 elements 14.5 dBd stainless steel screws, folded dipole **$110**

*** OUTPUT PCB's**
*** AVAILABLE SOON FOR**
*** REMOTE CONTROL OF**
*** DEVICES BY TX4000**

UHF CB Base Antenna 10 dBd vertical 5.5 meters long, all brass tube internally not coax, unbeatable performance **$250**
Repairs and Service **** All radios are repaired at OUR modern workshop with the latest service equipment and best technicians. Your equipment is not sent to other people or places it is looked after right here.

NEW PRODUCTS COMING SOON

.64 Ground plane 27MHz Vertical, UHF linear with receive preamp, 2 and 3 element Quad Antennas

Call or write to Mark for more info 668 Lutwyche Rd, Lutwyche, Brisbane 4030
Ph (07) 857 4400 Fax (07) 857 4400 Mobile 018 72 4272

Australia's Spectrum Management Agency will open up a Pandora's box of opportunities for companies to licence and then market frequencies.

Remember how several people ordered dozens of personalised number plates to be re-sold at a profit?

Get ready for more than a little enterpreneurial approach to the radio spectrum.

FREQUENCIES - BUY ONE, GET ONE FREE?

Maybe we will see late-night TV ads - large breasted women seductively selling the "hottest frequencies", or screaming announcers promising great radio bargains - "ring now, but don't send any money".

Or maybe "buy one, get one free" plus a free set of steak knives!

THE POSSIBILITIES ARE ENDLESS.

It could go even further.....the commercial channels are currently divided into 12.5 or 25 kHz slots, but will sub-letting allow users to split channels even further?

Will frequency selling become a commodity and be sold on the stock exchange and will we be given the closing prices for the VHF mid-band during the evening news?

Maybe our economy will be guided by the rise and fall of frequency stocks? How much of the spectrum can be sold to a foreign investor?

You might even be able to win frequencies on game shows or at the school fete!

YET TO BE ANSWERED

These and other questions are yet to be answered.

But who knows what's in store for scanner enthusiasts? It's hard enough keeping up with users changing their services around, how are we going to keep up with sub-letting of channels?

I'm sure within a year or two we will see some very dramatic changes take place affecting all users of the frequency spectrum.

But that's all from me, for now - the Financial Review says that 500 MHz frequencies are in demand, so I might call my broker and have him put my 500.245 allocation out in the marketplace.

WOOLIES MAYBE?

Maybe I could buy some of those cheap 800 MHz spots which Woolies have on special.....

CB-27MHz MODIFICATIONS TECHNICAL DATA

Learn to repair or modify any 27 MHz CB for maximum range and performance: Australian, USA, CEPT, UK, DX, FM, AM, SSB, etc.

- **BOOKS**
- **PLANS**
- **KITS**
- **HIGH-PERFORMANCE ACCESSORIES**

Since 1976, we've been the leader in technical information, parts and services for CB radios. Our CB books, plans, and kits have helped thousands of people worldwide. Find out why!

Air Mail Catalog A$ 5.00 or US$ 4.00

LOU FRANKLIN, K6NH
Owner

CBC INTERNATIONAL, INC.
P.O. BOX 31500 PHOENIX, AZ 85046
FAX (602) 996-8700

EDTRONICS

(A DIVISION OF GLASCELLE HOLDINGS P/L)
P.O. BOX 496, GLEN WAVERLEY, VIC. 3150
TEL; (03) 562 5186 FAX; (03) 562 5190

SPECIAL OFFER

EDTRONICS UHF PRE-AMPLIFIER

Our most popular UHF 477 MHz pre-amplifier complete with SO-239 and PL-259 connectors ready to use in line with your transceiver within seconds, giving you 15db receive gain.

Not only does it amplify the signal but also filters background noise. Your ability to make that clearer contact to repeaters will increase. Using 2 of these units will increase your networks range dramatically.

14 DAYS MONEY BACK GUARANTEE IF NOT SATISFIED.

R.R.P ~~$145.00~~ NOW $110.00

THIS OFFER ENDS 31ST MAY, 1993

Please send more information on the UHF Pre-Amp

NAME:.....

ADDRESS:.....

TEL:.....FAX:.....

A.J&J Coman

ANTENNAS

3el 10-11m	$152.00
4el 10-11m	$192.00
5el 10-11m	$233.00
Duoband 10-15m	$249.00
Delta Loop 10-11m	$172.00
⅝ Vertical 10-11m	$109.00
3el 15m	$171.00
3el 20m	$279.00
6el 6m	$181.00
5el 2m	$70.00
12el 2m	$112.00
2m Dingo	$86.00
Multiband vertical, no traps	$245.00
2⅝ C-Linear UHF Antenna	$76.00
Tri-band beam, no traps, 10, 15 & 20 metres	$650.00

PLUS FREIGHT

We are the new owners of the exclusive range of W.Wulf antennas & aim to provide the same quality service and antennas that you have come to expect so please call us and discuss your antenna needs.

Andy, VK3WH
Lot 6 Websters Road, Clarkefield 3429
(054) 28 5134

There's usually quite a difference when you start...

COMPARING CB RIGS TO AMATEUR TRANSCEIVERS

Part Three

Last month we were discussing the relative lengths of antennas, and explained how they tend to get larger as the frequency decreases. Once we arrived at a 40 metre-long quarter-wave whip we concluded that almost all amateur HF operation takes place from fixed locations!

We were also continuing to examine the differences between amateur and CB transceiver equipment, which process we continue this time by examining specific amateur transceivers.

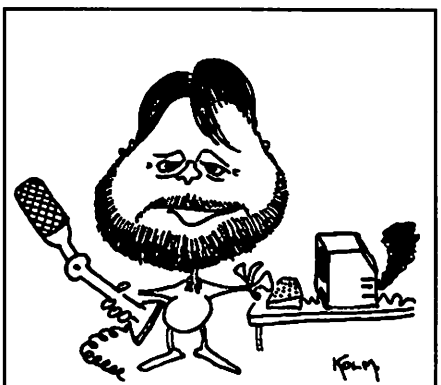
Amateur rigs are generally a lot more complex than CB rigs. There are quite a few reasons for this, with the greatly additional complexity of needing to operate on multiple bands one of the most obvious of these.

But it is also true to say that some manufacturers (mostly in the past, thank heavens) saw the average CB operator as a lot less sophisticated than the average amateur, and made radios to match.

I guess the cheeky thought process went something like this: if they can't tell the difference between a good radio and a lousy one, why go to the expense of building something good?

In other words, if they could avoid the expense of using the most efficient (read more expensive) technology and they produced only one or two models then some operations would. It's all tied in with commercial realities, of course.

If your better radio costs more money to make, then you'll have to sell it for more. And if the mug customer can't see the difference between a $200 radio and a $300 radio, isn't he or she more likely to buy the $200 radio? Of course. You'll still sell some of the more expensive ones, because some purchasers like to feel that they've bought the best there is, but by and large the volume seller will be the $200 unit, with the $300 unit the runner-up.



BY CHRIS EDMONDSON
VK3CE
EDITOR
AMATEUR RADIO ACTION

But the differences between 'ordinary' technology and leading-edge technology improve the end result by mere percentage points and double (or treble, or more) the price I'd say it's a pretty sensible marketing strategy.

Let's examine a complete range of amateur HF transceivers to compare the 'bang-for-the-buck' theory. For the purposes of the exercise we'll use the Icom range as our guinea pig.

At the entry level we have the Icom IC-728. This radio costs a rather surprising $1687.80. (Wow! That sets it apart from CBs already!)

Your money gets you 100 watts output, several modes including SSB (both upper and lower) and AM (like better CBs) plus FM (like Pommy CBs). Oh, and you can also plug a Morse Code key in if that's what takes your fancy.

The receiver covers from well below the AM broadcast band to 30 MHz, while the transmitter operates only within the confines of the amateur allocations on 160, 80, 40, 30, 20, 17, 15, 12 and 10 metres. Optional accessories include such things as antenna tuners, power supplies and solid-state (ie transistorised) linear amplifiers.

The differences go a lot further than that, though, and one of the primary reasons is that multi-band role.

The operating circuits need to be tuned for the frequency of operation, and the range from 160 to 10 metres is actually quite a wide one which requires a lot of additional circuitry, and therefore brings quite a deal of additional complexity and expense to the design.

When transmitting a continuous 100 watt signal, the IC-728 requires around 20 amps of 12 volts DC from your power supply or car battery — a significant amount of power.

So where does it differ?

Well, the receiver to start with. It's far

more complex than the average 11 metre CB receiver, and should be a good deal more sensitive as well.

It also freely tunes across the bands — in other words, it isn't locked into any specific channels.

This means it can serve a dual purpose: you can also listen to broadcast stations, shortwave services and utilities including military and aeronautical services.

To my mind that makes it a far more interesting proposition from the outset.

The receiver also covers the 11 metre CB band, although nothing at all would happen if you pushed the transmit button.

But if you were to put the Icom beside the average CB rig, and hook it into the same antenna, how would it perform on receive? In a word, much better.

The Icom's receiver has notch filtering and passband tuning, and a noise blanker which really works.

It's also far more sensitive and far more selective, which allow you to pick up signals which would simply be impossible on our average CB. So what are these magic gadgets and why doesn't the average CB rig get them?

With a notch filter you can remove a small slice of a signal from the receiver's passband.

When switched in, it sharply attenuates a narrow band of frequencies which may be carrying an interfering signal.

You'll affect the sound of the desired signal, but at least you'll still be able to hear it...

Passband tuning is really wonderful for HF, but is a feature you'd rarely use on a VHF or higher band. Some radios offer IF shift instead but, broadly speaking, the end result is a similar one.

Modern receivers convert the primary frequency of interest to a lower, more manageable one before extracting and amplifying the audio.

This method of conversion allows a far better control of the receiver's more desirable characteristics, and allows you to get a lot more gain from it.

The IF shift lets you minutely 'tweak' the IF frequency, which is another interference-combating device.

In fairness, I should add that these things are of greatest benefit where the users are free to select their own frequency of operation, and could therefore be operating on frequencies of any split from other users.

With CB, all users are on defined channels. Theoretically, as all the users on a specific channel are on exactly the same frequency as each other, if you notch out a undesirable signal you also notch out the desired one!

The noise blanker is capable of remarkable things.

Well, some are anyway. In our testing all of the amateur transceivers on the market we've found some noise blankers simply don't work...

The idea is to eliminate bursts of noise which detract from the desired signal.

You can't do much about bursts of static from lightning (I turn my radio off and remove (and earth, usually) the aerial) but you certainly can get rid of ignition noises and repetitive man-made racket like the aptly-named Woodpecker, which is an over-the-horizon radar signal.

The frequency stability of an amateur transceiver is generally orders of magnitude better than CB rigs.

However, again we find ourselves in a situation where excellent frequency stability is clearly needed in the data modes which amateur rigs often use.

The voice modes (particularly AM) aren't as sensitive to minor variations in frequency, and it would be quite possible for a radio to be tuned to, say, a Packet Radio bulletin board and simply left there, running in automatic unattended mode, for weeks at a time!

If the operator had to retune the radio every hour or two I can suggest someone who'd soon be looking for a new radio — or a hair transplant — very soon.

Most rigs will drift in frequency a little bit after powering up from cold, but should be pretty stable after that.

But some radios drift and wander, seemingly aimlessly, all over the place So the IC-728 has a few extra features, and works a wee bit better than your average howyergoinmate CB set. And I reckon it would want to.

Don't forget it costs a lot more — in fact, you could probably find ten (pretty ordinary) SSB/AM CBs for the price of just one IC-728, or five pretty good ones.

But heck, that's only the entry-level radio! What comes next?

The $1879.86 Icom IC-735. This one has been around for donkey's ages, but it's still very popular because it works okay and doesn't cost too much.

Its receiver is a smidgin more sensitive and quite a bit more selective than that of the IC-728. One of the main reasons for this is its triple-conversion design. It's quite a bit more complex than the other receiver, and that would show in really tough conditions, with the IC-735 perhaps just a tiny bit better to listen to.

...continued over page

G & C COMMUNICATIONS

END OF FINANCIAL STOCK TAKE SALE

CALL GRAHAM OR CAROLYN

19 Arleon Cres., Cranbourne, 3977
Ph/Fax : (059) 963 298

VK Computer P/L

131 Bathurst St, Sydney
Tel: (02) 283 2079
Fax: (02) 283 2092

— SPECIAL —
1 MEG SIMMS
$50

Motherboards
386 from $199
486 from $465
SVGA Monitor $418
CD Rom Drive $545
120 meg HDD $395

SYSTEMS
386 from $1100
486 from $1425

over 100 titles of latest CD'S

All major credit cards & mail orders welcome

COMPARING CB RIGS TO AMATEUR TRANSCEIVERS

(continued from page 47)

Next comes the brand new Icom IC-737. This radio is clearly different to the others, as it's quite a bit bigger than the IC-728 and IC-735. At $2613, it is also the least expensive amateur transceiver to offer a keyboard entry system for frequency. In other words, if you want 7075 kHz you can key it in, just like using a phone or pocket calculator, rather than having to whirl the tuning knob. It's also bigger, so it looks more expensive!

Quite a bit larger again is the $4999.38 Icom IC-765. Now we're starting to talk real money!

This radio is, for all intents and purposes, four times as expensive as the entry-level rig which appears capable of much the same things — and it's a whopping forty times as much as the CB set we started out with! I guess the way you get to see this extra expense for sure — apart from the extra size, of course — is the clearly nicer feel of the huge tuning knob, and the even more business-like look of it. It has many extra controls, and offers the user a number of additional features which he or she may not ever use. The receiver sounds a bit better, I guess, and it's capable of hearing things the IC-728 user would probably tune right past.

In truth, we're starting to talk semantics in some areas, but the built-in automatic antenna tuner and power supply are very welcome indeed.

So too is the larger tuning knob, which makes tuning weak stations a real breeze. The IC-765 also has a lot more presence. It's the way of telling the stations you work that you really mean business.

There's one more step in the Icom family, and it's a truly mammoth step indeed. Icom's peerless IC-781 is acknowledged as the best amateur transceiver money can buy. Perhaps that's as well, because it costs fully $10,000! (In case you're interested, it's presently listed at $9771.78 — down a little from its original $10,027.63 (No, I don't know how they work those crazy prices out either, but they sure look impressive!) but in the real world you could probably pick one up as a real snip for a little under $9000 if you talked fast.)

The IC-781 is pretty easily recognised as the two-way radio with the TV screen built-in. The screen shows the frequency(ies) presently in use, the memory channel information, or can graphically show all radio signals within a user-defined range of the selected frequency in a 'spectrum scope'. In another clever twist, by connecting a suitable decoder to a connector on the back panel (you'd expect the decoder to be supplied at the price!) you can also show on the screen the text being received direct off air from radio teletype (RTTY), AMTOR, PacTOR, Morse Code or Packet Radio stations.

This magnificent radio is bought by only the most discerning of customers, the ones to whom ultimate performance is paramount at any cost. It's also sometimes bought by the people to whom money is not the deciding factor and, dare I suggest, by rich dreamers who simply buy it because its price tag means something special to them.

There really is a ring to "...and the rig here is an IC-781, old man..."

But the levelling factor is the simplest one of all. When you transmit through one, the IC-781 sounds the same as the IC-765, which sounds the same as the IC-737, which sounds the same as the IC-735, which sounds the same as the IC-728. They all have the same microphone supplied as standard too!

Oh well. I guess you could option up to the desk microphone and get it gold-plated or something...

Just for the record, if all things were equal and you were using a set of reasonable quality, your AM/SSB CB radio, tuned to the same frequency and with the same Icom microphone plugged in, would stand a very good chance indeed of sounding just about the same as all the Icoms... But don't tell 'em I told you so!

Okay, so what's the catch? Why spend eight times as much money as the IC-728 on the IC-781 if the transmitter isn't eight times as good? Well, those tricky top-end receivers are really the expensive part of the equation.

They do differ starkly from one end of the range to the other. In fact, the IC-781 is capable of hearing everything the IC-765 hears — and as much again.

Pardon? Yep, you heard me right.

The IC-781 actually has two receivers, and can monitor, say, the 14.222 MHz DX Net at exactly the same time as, say, 14.169 MHz while you work someone on that frequency. The practical limit is about a 100 kHz split for full receiver performance, although you can possibly afford to move the two frequencies a little further apart and still enjoy useful performance.

As a matter of interest, the top Yaesu model sold in this country (the excellent FT-1000, imported by Dick Smith Electronics) also has two receivers, and it can tune to any two frequencies at one time! This seeming magic is performed by the receiver front ends, of which the Yaesu has two.

The IC-781's dual-receive range is limited because its receivers share common front end circuitry. Another tricky feature of the Yaesu is its two selectable antenna inputs. You could tune Receiver

A to the BBC on your long wire antenna and Receiver B to exactly the same frequency on a completely different antenna, perhaps a log-periodic Yagi beam of some sort.

About now you might discover a truly remarkable thing: the signal troughs we are so accustomed to when listening to international broadcasters actually vary when polarisation and antenna directions are toyed with.

You could find yourself with a strong signal on one receiver and a complete fade-out on the other then, seconds later, experience the same thing but the other way around! Quite amazing...

The three major Japanese amateur equipment manufacturers are better known for different things. Kenwood, for example, is recognised for the fine quality of its transmitted audio. There are lots of operators who instinctively know when they're listening to a Kenwood transceiver, such is the amount of the difference in some cases.

That Kenwood sound is sooo smooth! But that can be a trap for the unwary. I suspect an Icom engineer would tell you that it's narrow, peaky audio which penetrates really nasty conditions best.

Kenwood's bassy 'broadcast quality' can be pretty hard to hear under those conditions.

Well aware of the limitations of conventional analogue audio arrangements, Kenwood recently introduced an optional digital audio processor to its range, and this can be used to tailor your audio in a variety of ways.

In a future column we'll deal with the importance of having the cleanest possible audio without going over the top — and why shouting into the microphone reduces your range rather than extending it.

In the meantime, enjoy your time on radio, and remember — people are listening!

Reviews...

COMMUNICATION RELATED BOOKS WORTH READING

RADIO RECEIVERS — CHANCE OR CHOICE

Shortwave doyen Arthur Cushen sells several radio books, and his two latest offerings can help DXers get that little bit more out of the hobby. "Radio Receivers - Chance Or Choice" and the sequel "More Radio Receivers - Chance Or Choice" are both excellent books to get you thinking about what you want in a new shortwave radio. Wading through all those glossy manufacturers brochures can be a tangle of technical specifications, especially when companies use different standards to justify the performance of the radio.

So how do you cut through the maze? These two books present the most thorough and most professional receiver reviews on the market.

In the first few chapters, author Rainer Lichte explains the art of radio reception and what makes up a good receiver, using words and pictures to explain all the technical terms found in those brochures.

He then evaluates over 60 shortwave receivers and offers his own comments on how to get the most out of each model.

"More Radio Receivers" is an update and companion to the first book. In addition to his close scrutiny of the latest gear, Rainer examines trends in shortwave radios and gives some pointers to the new breed of receivers which are appearing today and tomorrow.Together, Lichte's books are a valuable resource on virtually every modern shortwave radio, both the new sets and those available on the secondhand market.

If you're serious about choosing a new radio, especially one of the expensive top-shelf rigs, then these books belong in your shack. ...*Reviewed by Rob Williams*

"Radio Receivers - Chance Or Choice": $A14.95
"More Radio Receivers - Chance or Choice": $A19.95
From: Arthur Cushen, 212 Earn St, Invercargill, New Zealand.

PASSPORT TO WORLD BAND RADIO

For those armchair DXers who love to travel via their radios, now is the time to pick up the latest copy of the "Passport To World Band Radio".

The 1993 edition continues the reputation the Passport has built up over the years with material that has been gathered by top DXers from around the world.

No matter how experienced you are, you'll find the Passport has a swag of information to help you log all types of shortwave stations.

This is a true reference book, not only of frequencies but data on numerous aspects of the hobby, from buying a new radio to finding out how to QSL relay stations operated by the big powerhouse broadcasters - all packed into just over 400 pages.

The Passport includes several feature articles including a fascinating look at clocks for world band listeners, choosing your new radio and reviews of the latest gear.

There are also some great pictures of many popular announcers behind the microphone, which is something radio can't share with the listener.

The sheer size of the station contact list shows you the large number of hours that must have gone into compiling all this information - including names and addresses, phone numbers, return postage details and practical tips on how to get that rare QSL card.

Other chapters appeal to shortwave listeners who want to find something new to listen to.

The top 10 best shows for 1993 are discussed in depth, together with times and frequencies so you can enjoy them too.

The Passport also looks at 20 "big gun" broadcasters that you should be able to hear daily without any trouble.

The comprehensive breakdown of broadcasts, with a clear leaning towards English language programs, gets you going with a minimum of fuss.

The "Blue Pages" section provides a unique channel-by-channel look across the bands.

The information you'll find here isn't 100 per cent accurate, due to the changes which shortwave broadcasters are always making, but it is a good starting point.

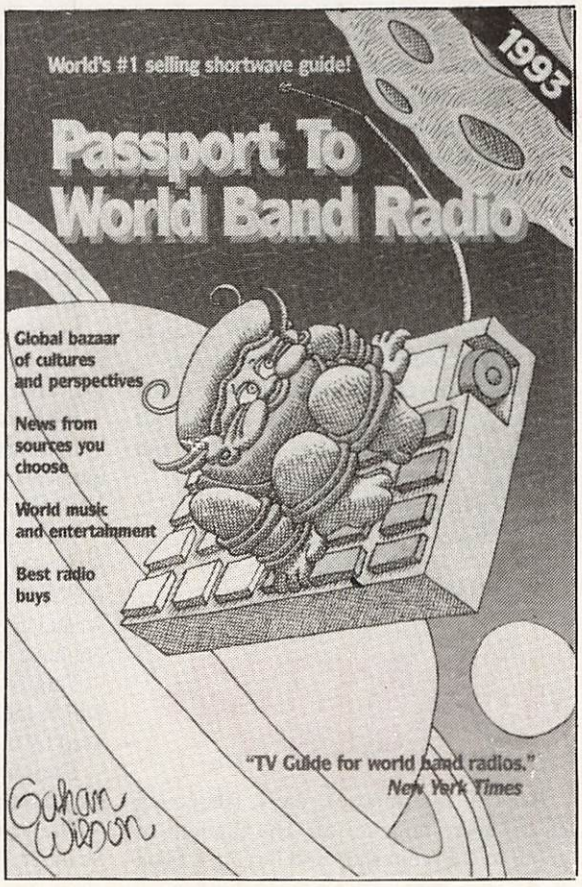
Even the advertisements make great reading, as you get an idea on what gear is available to our fellow DXers in the states.

In every way, this book truly is your passport to shortwave radio.

Craig Tyson, Australia's contributing editor to Passport, has kindly donated a copy to give away to our CBA readers - see this issue's DX Log for your chance to win! ...*Reviewed by Rob Williams*

"1993 Passport To World Band Radio": $29.95 rrp
From: Dick Smith Electronics, Arthur Cushen.

(continued over page...)


World's #1 selling shortwave guide!
1993
Passport To World Band Radio
Global bazaar of cultures and perspectives
News from sources you choose
World music and entertainment
Best radio buys
"TV Guide for world band radios."
New York Times
Graham Wilson

Reviews...

COMMUNICATION RELATED BOOKS WORTH READING

EASY SHORTWAVE ANTENNAS

Of all the correspondence I get from CBA's shortwave readers, the most common questions concern setting up a shortwave antenna. With all that has been written about antennas, the only sure way to get what you want is to experiment - try a few different antennas and see which one most suites your requirements. There are several options to consider, including the available space, the direction you want to receive from and of course how much of the HF spectrum you wish to monitor. Frank Hughes' book "Easy Shortwave Antennas" discusses 50 different experimental shortwave antennas, in a very light and readable style. It begins with the principle and practice of HF antenna, then moves on to the hardware and how to get the antenna together and in the air.

As the name of the book implies, only easy shortwave antennas are looked at - longwire, balanced, vertical and grounded antennas are all covered, with plenty of well-illustrated ideas on how to employ the basic design. DXers dwelling in flats and townhouses can take heart - Frank hasn't forgotten about you!

You can't expect the same quality reception as if you had a 100-acre property, but the space-saving indoor designs presented represent a good compromise.

A book like this is ideal for the experimenter who is always on the lookout for better signals and a better antenna - and isn't there a little of that in all of us?

Reviewed by Rob Williams

"Easy Shortwave Antennas":
$A19.95
From: Arthur Cushen.

THE SPECTRUM ULTIMATE SCANNER FREQUENCY REGISTER

Back in the good ol' days, frequency guides were unheard of. The thought of going into a radio shop and buying a book full of frequencies would have had the average scanner user shaking with anticipation.

Today, like scanners themselves, frequency guides and registers are commonplace.

Most are extracted from the Department of Transport & Communications' public access computer records, presented in "hard copy" or printed form to suit a broad range of frequencies and services.

The "Spectrum Ultimate Scanner Frequency Register" covers all Victorian-licenced radio users between 30 MHz and 1000 MHz.

Organised in alphabetical order, the USFR conforms to the DoTaC general users format, but has the added bonus of a detailed look at the police, fire and ambulance emergency services.

This sets the USFR aside from other publications which list little more than frequencies and callsigns.

However, I must take USFR editor Michael Evans to task for the introduction, in which he states that "many frequencies for the National Security Organisations are protected under law and as such may not be published even if known."

This is garbage!

In this country, NO frequency is "protected under law", surprisingly not even the cellphone frequencies.

What is protected by law are the conversations of persons using certain frequencies which are part of the telephone infrastructure.

There is no law to prevent anyone from publishing the frequencies of ASIO, ASIS, the Defence Signals Directorate or whatever. The authorities may not like it, but have to live with it.

This is illustrated by the fact that the USFR includes every Victorian frequency used by the National Crime Authority.

They are not listed as NCA, however, they are there if you know where to look.

That aside, the "Spectrum Ultimate Scanner Frequency Register" delivers to the purchaser an easy to use and well laid out reference book.

Other editions besides Victoria are available - enquiries to Talkback Systems.

Reviewed by Russell Bryant

"Spectrum Ultimate Scanner Frequency Register" (Victorian edition): $40
From: Talkback Systems Australia, PO Box 624 Hawthorn, Vic, 3122.

LISTENING IN TO AIRCRAFT RADIO

Following the success of his first book, "The Australian Airband Guide", Bob Bell has released this new updated edition which combines frequencies for the experienced aero monitor and lots of interesting information for people like myself who are relatively new to aircraft radio scanning.

After some problems with the glued binding of the first edition, the new book is now staple-bound, which is easier to lay flat on a table. There has also been a change in size, from the smaller A5 to the larger but more standard A4 size - I prefer A4, but this is a matter of choice.

For the newcomer, the book has a wealth of information, starting with a comprehensive glossary of terms and an outline of the various aircraft frequency bands right through to an example of digital satellite communications known as ACARS. Bob thoughtfully uses the example of tracking a complete Qantas Sydney to Los Angeles flight to demonstrate the various HF, VHF and UHF frequencies used, both on the ground prior to take-off and in the air.

The diehard aero monitor will benefit from one of the most comprehensive, informative and easy to read frequency lists that I have seen for a long time: major Australian and world airports are covered, as are United States and Australian military, world civil aviation companies, and control frequencies worldwide. Bob Bell's reputation as Australia's number one airband expert is once again confirmed with this book, which I highly recommend both as a guide for starting off in aero monitoring and a frequency list to keep your appetite well whetted.

Reviewed by Andrew Ridge

"Listening In to Aircraft Radio": rrp approx $20
From: Dick Smith Electronics and Airband Communications (PO Box 16, Georges Hall, NSW 2198).

Spectrum Anarchy

By Rod Fewster

ANOTHER WIN FOR GME ELECTROPHONE!

Late in March a privately-ownded yacht on its way from Vanuatu to Australia became firmly wedged on a reef in the middle of nowhere, but rescuers didn't have to scour half the Pacific Ocean looking for survivors, they were able to locate the crew with no trouble by tracking the distress signal transmitted by one of Electrophone's EPIRBs.

This magic little $250 device guided rescuers to the spot within hours and saved the many thousands of dollars which would otherwise have been spent on a visual search.

Designed to be used only in emergencies, EPIRBs transmit signals which can be received from virtually anywhere on the ocean by satellites and can be homed in on by aircraft and surface vessels.

In the past, EPIRBs have even helped rescuers find shipwrecked sailors bobbing around the ocean in lifejackets.

I reckon you're crazy if you put to sea without one.

HEY, HOW ABOUT SOME NEWS!

Not much other local news to report this time around.

With typical Australian "she'll be right mate" and "let somone else do it" attitudes, readers have refrained from letting me know what's been going on around the place by the thousand.

No input means no output.

WHAT'S LEGAL AND WHAT'S NOT

As the skip cycle fades Australian DXers are frantically chasing signals from all over the place, but how many of these signals are "legal" transmissions from the originating countries?

Here's a comparison between Australia and a few other countries ... what's legal and what's not.

AUSTRALIA

A licence is required but there is no examination.

The annual licence fee is currently $18.

The Department of Transport and Communications (DoTaC) issues alpha-numeric callsigns which indicate the state in which the licence was issued.

Handles and Club Callsigns are permitted.

Australia has two CB radiobands ... the "USA-standard" 27 MHz, and UHF-CB.

* 26.965 - 27.405, AM/SSB, 40 channels, 10 kHz spacing, 4W/12W max power.

Legal 27 MHz CB transceivers use the operator's choice of AM or SSB on the following frequencies:

1=26.965	2=26.975	3=26.985	4=27.005	5=27.015
6=27.025	7=27.035	8=27.055	9=27.065	10=27.075
11=27.085	12=27.015	13=27.115	14=27.125	15=27.135
16=27.155	17=27.165	18=27.175	19=27.185	20=27.205
21=27.215	22=27.225	23=27.255*	24=27.235*	25=27.245*
26=27.265	27=27.275	28=27.285	29=27.295	30=27.305
31=27.315	32=27.325	33=27.335	34=27.345	35=27.355
36=27.365	37=27.375	38=27.385	39=27.395	40=27.405

Channels 23, 24, and 25 are not in ascending order.

The current 40-channel allocation grew out of the old US 23 channels.

24 and 25 filled the 20 KHz gap between 22 and 23.

6 to 40 were added in ascending order.

Australia originally introduced a "one-off" 18-channel allocation which included 27.095 MHz (channel 7) and 27.195 MHz (channel 16).

These frequencies were not used by any other country, and their use is now prohibited in Australia.

The following AM/SSB channels have special uses either by regulation or by common usage:

Channel 8 - Official Highway Channel
Channel 9 - Official Emergency Channel
Channel 11 - Official AM calling
Channel 16 - Official SSB calling (LSB)
Channel 35 - Unofficial SSB calling (LSB)

476.500 - 477.475 FM "UHF-CB", 40 channels, 25 kHz spacing, 5W max power.

Channel 5 - (5/35 repeater)
Emergency Channel 11 - Calling
Channel 40 - Highway Channel

A unique feature of Australia's 476-477 MHz band is that repeaters are allowed.

No other country permits the use of repeaters on CB radio.

Inputs are on Channels 31-38 and outputs are on Channels 1-8.

A repeater must use the proper channel pair, ie: 1/31 to 8/38, and automatically identify itself.

The maximum legal power output for a repeater is 21W EIRP.

USA

No licence is required to operate a CB radio in the United States.

The Federal Communications Commission (FCC) did at one time require a Class "D" licence for Citizen's Band which, as in Australia, required nothing more than filling out the form and mailing it in with the licence fee.

In the early 1980s the FCC decided that the work involved in CB licensing outweighed the benefits, and put CB radio under a blanket authorization.

The FCC allows police and certain local authorities to autotransmit one-way broadcasts about highway conditions, etc, on CB radio.

* 26.965 - 27.405, AM/SSB, 40 channels, 10 kHz spacing, 4W/12W max power.

Special-use channels:

Channel 9 - Emergency Channel
Channel 11 - AM calling
Channel 16 - Official SSB calling (LSB)
Channel 17 - Unofficial "Truckers" Channel (California & Western States.)
Channel 19 - Official "Truckers" Channel (Nation-wide)
Channel 35 - Unofficial SSB calling (LSB)

US regulations prohibit "DX" long-distance communications (over 150 miles) on CB radio.

Directional antennas may be used to enhance communications within the legal range.

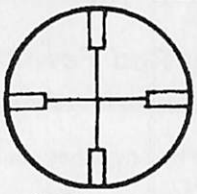
There are two additional radio bands besides CB in the USA which are intended for use by private individuals with minimal regulation.

* The GMRS (General Mobile Radio Service) is located in the 460-470 MHz band.

A licence is required.

* The 31.0-31.3 GHz microwave band can be used by licenced users of several fixed and mobile radio services, including the GMRS.

This report will be continued in the next issue commencing with Canadian requirements.



SNIPER

THE ULTIMATE VERTICAL BASE STATION ANTENNA NOW ONLY $75 ... DELIVERED RIGHT TO YOUR DOOR !

Since 1975 ... long before legalization ... the SPR-27 was the first choice of Australian CBers who wanted the best vertical base station antenna, and many of the original Mark 1 models are still in use today.
The SPR-27 Mark 2 was the ONLY base antenna ever rated "TEN-OUT-OF-TEN" by CB Action, and the design remained unchanged from 1976 until we ceased production in 1990.
We went one better with the SNIPER ... a half-wave vertical "straight stick" with no rings or groundplanes or tuning coils or adjustable capacitors or gamma matches ... an antenna which NEVER needs tuning and doesn't go haywire every time it rains.
The SNIPER is the only base station antenna to ever get a BETTER rating from CB Action than our SPR-27 ... and "TEN-OUT-OF-TEN" was a hard act to follow. No other antenna has even come close !

WE'RE STILL NUMBER ONE !

Forget about "five-eighth wave" and "point six-four wave" antennas ... recommendations from satisfied customers sell more antennas than all our advertising and the SNIPER is the antenna everyone's talking about !
The more antennas we sell, the more aluminium we buy, and the more aluminium we buy, the less we pay for it. We recently purchased a mountain of aluminium, and until this runs out we'll be passing the savings on to our customers.

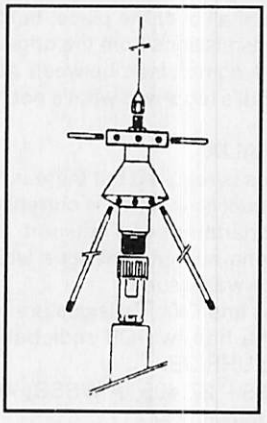
For a limited time, we'll send you a SNIPER right to your door by Express Courier for only $75.
When you can have Australia's best base station antenna dropped on your doorstep for only seventy-five bucks, why would you even think about buying anything else?

SCANTENNA-XLR SCANNING DISCONE

The Scantenna-XLR wideband discone antenna covers 25-1300 MHz and is ideal for use with all scanners, including "super-scanners".
Check out the specifications ....

* 100% Australian designed and manufactured from top-quality Australian raw materials.
* Precision-machined aluminium disc/cone head assembly.
* 16 lightweight tubular aluminium discone elements.
* Stainless steel vertical element
* Weatherproof low-loss N-type coaxial connector.

The Scantenna-XLR performs at least as well as any comparable antenna on the market and better than most, no matter how much they cost ... and the Scantenna-XLR is 100% Australian !!If you're not using a Scantenna-XLR ... you're not getting the most out of your scanner !



Price ... $160 including Insured Freight anywhere in Australia.

STARDUSTER YAGI BEAMS

SPR-STARDUSTER yagi beams are constructed from high-grade aluminium tubing ... light enough for a medium-duty rotator but strong enough to withstand a hurricane. Elements aren't just poked through holes in the boom or attached with "plumber's nightmare" drilled aluminium plate monstrosities. Our exclusive element-to-boom compression brackets guarantee that elements will never twist out of alignment. Heavy-duty boom-to-mast bracket included.
Prices: 3-Element ... $130 4-Element ...$160 5-Element ...$190 6-Element ... $220
Insured freight $40 ...delivered right to your door anywhere in Australia.

BANKCARD/ MASTERCARD/ VISA WELCOME BY PHONE OR MAIL

SOUTH PACIFIC RADIO

6SYLVAN COURT
KALLANGUR
PHONE (07) 204 5000

MAIL ORDER DEPT-
PO BOX 29 KALLANGUR
QUEENSLAND, 4503

HF Utilities

By Richard Jary

Welcome to another issue's worth of HF Utilities. Let's start with some bad news for those of you with morse code interests.....

US COAST GUARD ABANDONS CW

Effective from 1 August this year, all United States Coast Guard communication stations and cutters will discontinue watchkeeping on the 500 kHz distress frequency, and will cease all morse code services in the MF radiotelegraphy band. More efficient telecommunication systems are now available to provide the mariner with options for initiating or relaying distress alerts, and passing and receiving maritime safety information.

These options include INMARSAT, Radio Telex (SITOR), MF/HF single sideband and VHF radiotelephone, satellite EPIRBS (for distress alerts and telecommunications) and INMARSAT satellite network SafetyNet and Navtex Broadcasts.

Distress and other calls to any US Coast Guard Communication Station will still be made on the following HF single sideband radiotelephone channels: 424 (4134 kHz), 601 (6200 kHz), 816 (8240 kHz), or 1205 (12242 kHz). Meteorological broadcasts are also made over these channels.

HF TIPS FROM TASMANIA

Back in January, we had a query on WA search and rescue frequencies. Brian from Tasmania has heard Coast Watch Aircraft on 2592 kHz with the callsign VH-EXH.

He also comments that all the frequencies mentioned in the article are listed by him as Federal Police rather than Customs, except for 7690 kHz. I believe Federal Police and Customs work closely together, perhaps someone can clarify these?

Brian also has a list of frequencies from the WIA broadcasts relating to the latest Gulf conflicts. These are 4742, 6750, 9011, 9032, 11234, 11243, & 14214 kHz. All except 14214 are listed as US Air Force, and are USB.

LATE MAIL

Looking back through the mail I've found some info posted last year by Lino from Cranbourne. Sorry about the delay, Lino. He is keen on monitoring aircraft, which seems to be a fairly popular past-time and one of the easiest to start with if you are wondering how to get involved in HF utes.Lino supplies the following frequencies used around the Pacific:

North Pacific Area: 2932, 5628, 13300, 17904 kHz.

South Pacific Area: 3467, 5643, 8867, 13261, 17904 kHz.

Central East Pacific: 2869, 3413, 5547, 5574, 8843, 13288, 17904 kHz.

Central West Pacific: 2998, 4666, 6532, 8903, 11384, 13300, 17904 kHz.

It's been fairly quiet lately in the post office box, so I don't have much in the way of hot tips from other readers to offer you. Guess everyone was too busy over the Christmas holidays to listen to the radio.

HF RAILWAY FREQS

Last month I received a copy of the new Handbook of Australian Railway Frequencies, written by CBA's very own Russell Bryant. This book is very worthwhile for anyone interested in railway listening, both on HF and VHF/UHF.

Railways use HF mainly for remote areas where the distances involved are too much for VHF or UHF to handle.

A selection from the handbook shows that Australian National in South Australia use 4475, 5900 and 9785 kHz; Queensland Government Railways can be monitored on 5377, 5900 and 9781.5 kHz with control stations at Cairns, Cloncurry, Hughenden, Roma, Townsville and Zillmere (Brisbane); the NSW State Rail use 3158 and 4510 from Breadalbane, as well as 3828, 5900 and 7360 kHz from Cootamundra and Dubbo. V/Line use 2580 and 4475 Victoria-wide, while the Western Australian Government Railways use 2712, 3820, 5900 and 9320 kHz for remote area workers.

Our friends in Tasmania and New Zealand miss out on HF, and will have to put up with listening to the rest of us!

WHAT'S IT DOING?

I've had a letter from a reader who lives near Moorabbin airport, to the southeast of Melbourne. He has recently seen an Aero Commander plane regularly flying out at dusk, doing a 360-degree turn over Brighton Beach before returning towards Moorabbin. The aircraft is painted a very dark beige, and registration letters are VH-DCA.

He is curious as to what this dark painted aircraft is up to, and wonders if anyone has heard it on HF or airband?

DOING IT WITH STEALTH

Talking of aircraft, aeradio expert Bob Bell reminded me of a current American high tech project called Aurora which involves the studies into super Stealth-type planes capable of flying at around mach 5 or 6. I don't know of anybody that has heard these with an obvious callsign, but there have been reports of mysterious aircraft breaking windows around California and Nevada as well as unusual happenings in Scotland.

Whether the aircraft would use FLTSATCOM or normal HF for communications is unknown, but something to keep an ear out for.

HEAVY SECURITY 737S

At the same time, unmarked white 737s using a callsign Janet followed by a number are landing at Las Vegas airport. These planes are under heavy security, and it is believed they may be used to ferry employees from Nellis AFB for breaks at the casinos. Another one to listen out for.

That almost wraps it up for this month. Just a reminder that magazines like CB Action are here to help you answer any questions you may have regarding radio - so if you have an unknown frequency or service that you would like help with, just ask. Someone out there is bound to know. Similarly, if you have something you would like to share and get credit for, then tell us.

Your comments and contributions are always welcome at;
PO Box E160, St James, NSW 2000.

Until next time, it's 73s from me.

W.A. 000 CALLING

By "Radar"

If you enjoy scanning the taxi frequencies, but wonder what the codes mean, this report will put you in the picture

In part one WA 000 CODES, (JAN/FEB) CBA, I gave you an overview of emergency services in the west. In part two, I'm taking on something entirely different - namely the Australian taxi codes.

Note that when programming UHF taxi frequencies into your scanner, you must program both the TX (base) & RX(mobile) into your receiver for each channel as taxi allocations in UHF are of the semi-duplex system as opposed to the police full-duplex system).

As long as the mobile is within five kilometres of your receiving location, and no obstructions are between you and the mobile, you should be able to hear mobile as well as base transmissions.

A word of warning...beware of some language used by some drivers when they feel that they've been burnt (done wrong by) by the job dispatcher!

TERMINOLOGY IN USE BY PERTH TAXI COMPANIES

POINT

The designated call code for use when a time limit is to be called by job dispatcher, that is `Y10' means 10 minutes for any car bidding to complete present hiring and to pick-up this fare.

SLIPPERY or A12

Police in vicinity, drive carefully.

RED SQUARE

This term is used only when any car at all is bidding for a job being called, but, if a cab bids for job from an adjacent taxi rank, and another cab bids from a position within that taxi rank's boundary area, then the cab not on the rank is deemed to be `in the RED SQUARE' of the cab on the rank.

PERTH TAXI CODES

M1	Driver requests more/further information regarding pick-up address
M2	Driver wishes to book taxi for client via radio to base.
M3	Driver to check charge account details.
M4	A message delivery.
M5	A favour to driver from job dispatcher.
M6	Undesirable fare, abusive, etc.,
M7	General enquiries.
M8	A local fare.
M9	A regular company fare.
M10	A parcel/luggage pick-up.
M11	Driver picked up fare/goods okay.
M12	Driver has delivered fare/goods okay and the metered price on completion was $000.00.
M13	Doubtful paying fare, known to have evaded paying fare previously.
M14	A pay later fare.
M15	Driver reporting another for bidding out of position.
M16	(RESERVED).
M17	Regular (night worker) (in use with one company at present).
M18	(RESERVED)
M19	Bank/Prison escort, job may be dangerous, driver has right of refusal.
M20	Rank fee enquiry.
M100	A Multi-Purpose hiring,

COMPANIES AND CHANNEL/FREQUENCY INFORMATION

Black& White/Green & Gold Taxis are operated by: Taxi Industry Company.
Administration and base: Fauntleroy Avenue, Perth Domestic Airport, phone 333 3333 for taxi bookings.

CH	FREQUENCIES	TRANSMITTER SITE	SERVICE AREA
1	(base) 488.500 (mobile) 483.300	Sheraton Perth Hotel	CBD & North & Western
2	(base) 488.800 (mobile) 483.600	R & I Tower Perth	Southern & Eastern
3	(base) 489.400 (mobile) 484.200	Tuart Hill(TVW 7)	Multi purpose taxes/taxi trucks

Perth administration and base: 1008 Wellington St, W. Perth Ph: 322 0111 for taxi bookings.
Fremantle administration and base: 1 Beach St., Fremantle Ph: 335 3944 for bookings.

CH	FREQUENCIES	TRANSMITTER SITE	SERVICE AREA
1	(base) 488.525 (mobile) 483.325	Yokine	North Eastern District
2	(base) 488.625 (mobile) 483.425	Kings Park	CBD and Western Districts
3	(base) 489.325 (mobile) 484.125	Doubleview	West Coastal Districts
4	(base) 489.175 (mobile) 483.975	Burswood Resort	South Eastern Districts
5	(base) 488.900 (mobile) 483.700	Oconnor	South Western Districts (Fremantle -Rockingham)
6	(base) 489.025 (mobile) 483.825	W. Perth base,	General Enquiries/Peak Channel
7	(base) 488.775 (mobile) 483.575	Wanneroo	Northern Districts
8	(base) 489.450 (mobile) 484.250	W. Perth base	Taxi trucks, peak channel

ie. disabled taxi hiring.

M99 For discretion, I won't release details on this code.

MAYDAY No need to explain this code, for obvious reasons.

TAXI CAB FLEET CODES

CODES	FLEET NOS
CAR 001-099,	vis: CAR42=042
FOX 100-199,	vis: FOX92=192
DON 200-299,	vis: DON17=217
KAY 300-399,	vis: KAY44=344
RED 400-499,	vis: RED10= 410
VEE 500-599,	vis: VEE31= 531
ESS 600-699,	vis: ESS67= 667
BLUE 700-799,	vis: BLUE29=729
GREEN 800-899,	vis: GREEN1=801
PINK 900-999,	vis: PINK53= 953
BLACK 1000-1099,	vis: BLACK 12=1012
MACK 2000-2099,	vis: MACK 51= 2051.

TIME CODES

'Y5' or 'X5' is used exclusively in the CBD of Perth city, five minutes for pick-up requested by job dispatcher.

'Y10' or more is called for any other area outside of Perth CBD and is generally given in time to comply with location of pick-up address, eg. inner suburbs, 'Y10' or 10 minutes, to outer fringe suburbs, eg. JARRAHDALE, BINDOON or SERPENTINE, may be alloted as much as 'Y45' or 45 minutes, dependant on the response of cabs working MIDLAND or ARMADALE or ROCKINGHAM area.

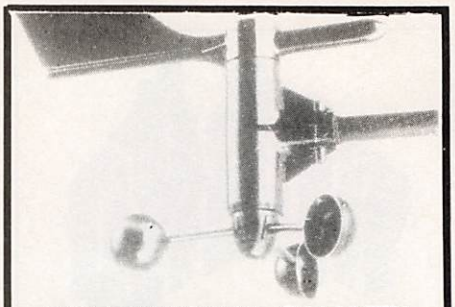
So there you have it, a comprehensive guide to understanding taxi codes in Perth WA and I believe that codes in use elsewhere in Australia are not much different to those used in and around Perth.

I hope the above will provide something of interest to readers of CBA and especially to WA readers.

I drove for all three named companies at different times. Black and White and Gold merged to form Taxi Industry Company and are trading as both in name.

All up I drove and operated as relief dispatcher with the latter for six of the eight years thatI spent in the industry. Prior to that I was for many years a railway man, but that's another story.

All enquiries and/or information to:
PO Box 297,
Cloverdale,
West Australia, 6105.



PROFESSIONAL QUALITY WEATHER STATION NOW AFFORDABLE ENOUGH FOR HOME USE!

The new WeatherPro weather station uses state-of-the-art technology to give you full monitoring capability at an incredibly low price. The WeatherPro includes a weather computer, remote precision wind direction vane, wind speed sensor, external temperature probe mounting hardware and 40' of cable.

- •WIND SPEED
- •TEMPERATURE
- •WIND DIRECTION
- •TEMPERATURE HI/LO
- •RAINFALL (OPTIONAL)*
- •WIND GUST
- •WIND CHILL
- •TIME
- •AUTO SCAN
- •1 YEAR WARRANTY

DIGITAR WEATHERPRO

For information and price contact:

SOLAR FLAIR PTY LTD
P.O. Box 18, Emerald, Vic. 3782
(94 Beaconsfield Road)
Ph: (059) 684 863 Fax: (059) 685 810
ACN 006 399 480
B/CARD M/CARD VISA

DEALER ENQUIRIES WELCOME

COMMEX COMMUNICATIONS CORPORATION PTY LTD

A.C.N. 010 905 718 (A DIVISION OF RANGER COMMUNICATIONS INC.)

Phone:
(07) 357 7122
(07) 357 7331
Fax:
(07) 357 7032

UHF CB

RCI 2950 28 MHz TRANSCEIVER

This top of the range mobile transceiver will let you enjoy the ten metre band like never before. It features all modes of operation (USB, LSB, AM, FM and CW), 10 memories, repeater offset, dual VFO, three tuning steps, RIT, noise blanker, power control, multifunction meter (transmit power, receive signal strength, modulation and SWR) and 25 watts of output power on SSB. Its modern design and its versatility make this transceiver the ideal radio to enjoy ten metre DXing.

SRA 144 28 MHz ANTENNA COUPLER

Get the most of your 10 metre transceiver from top to bottom of the band with this newly designed antenna coupler. The unit will automatically maintain low SWR across the entire band in order to obtain maximum power output from your radio. It is also suitable for 27 MHz.

JACKAROO

This high performance hand held radio features all 40 channels of the CB band, with repeater offset, high and low power switch (0.25/2.5 watts), and comes complete with antenna, wrist strap, carrying case, wall charger and battery pack. Also available as standard accessories is the SRA 106 speaker microphone and drop in charger.

12 MONTH WARRANTY ON ALL PRODUCTS — 12-24 VOLT OPERATION ON ALL CB'S

PRODUCT COLOUR CATALOGUE AVAILABLE ON REQUEST
UNIT 13/121 NEWMARKET RD, WINDSOR, BRISBANE 4033

AUSTRALIAN ASSOCIATION OF CITIZEN and BAND RADIO OPERATORS Inc.

ACBRO'S WORK DELAYED

In a period prior to the general Federal Election the ACBRO committee chose to put matters that were before the Minister of Communications, and others pending, on hold.

It was thought to be not unreasonable to think that the Minister's Office needed any CBers problems, at a time when what appeared to be an unwinable election, like a hole in the head.

Now, after the event, when it was reasonable for the committee to think that they would be dealing with a different government, they see that the people have voted for more of the same. So at least six weeks of life has gone by for him and the relevant public servants without mail being received bearing the ACBRO logo.

Now, however, for ACBRO, it is back to business in raising issues to the "powers that be" on behalf of its members.

SIMPLEX REPEATERS

Following release of a report in CB Action (Jan/Feb 1993) about a radio modification that could be made to convert such as a CB set into a simplex repeater, developed by Jensen Electronics in Adelaide (SA), the committee chose to accept discussion of such a "beast" on its agenda.

Some were only aware of the repeaters used on UHF CB and immediately shuddered at the thought that other varieties of repeaters could be considered to perhaps use up more of the channels, by having them allocated their own frequency as is the case with what is known as "duplex" repeaters.

Others listened intently as to how such a facility could accept a message being transmitted by putting it into digital storage and replaying it immediately the message ended.

They found it hard to grasp that they would be able (as could many others) to sit back and hear their message "go to air".

"Who knows?" said one, "some of the operators may hear their voice for the first time and never transmit again."

However, following some jocular comment, and further explanation by the committee expert (every committee has one), they could see that there was a side to simplex repeaters that may make them undesirable as a facility if used on any part of the Citizens Band Radio Service (CBRS).

As is always necessary in a committee such as ACBRO, it is known that any decision made, or request for change is sought, such should occur only if it appeared to be in accordance with the wishes of those that they represent.

And on something as new as a simplex repeater for CB, despite the fact that they have been around elsewhere for some time, it was realised that their own first impressions of such a new toy's benefit or otherwise, required them to tread carefully.

Furthermore, when it was realised that the producer of such a marketable line as was being discussed, was in fact one of ACBRO's respected supporters, they replaced even their soft shoes with slippers.

It is understood that when this particular simplex repeater had been given type testing approval from the authorities, it was said that they could not be licensed for use as part of a CB set modification for the CBRS.

However, in an area where the possibility existed for the government to introduce another form of radio license and collect a fee (tax) for one's ability to legally use it, it was felt important to raise the issue with the said authority and that an air of caution should be adopted.

Again, this had to be done without offending those involved in the CBRS who may have opposing views, as it could clearly be seen during these discussions, that it was a very useful tool - in its place.

The committee indicated clearly that they were not in the business of offending their valued supporter and advertiser.

SOFTLY SOFTLY APPROACH

The committee therefore resolved that the President would sit with the Association's scribe to draft a letter to the Minister of Communications to seek consultation should it be his desire to regulate that simplex repeaters may be used or licensed for use in the CBRS.

The reason for seeking such consultation should be justified by the following reasoning:

MAJOR RESULTS

Research into the causes and prevention of Multiple Sclerosis has already had important results. A cure could be only dollars away.

MS

Multiple Sclerosis.

1. The use of simplex repeater in the CBRS should not be considered in major cities and built up areas, particularly where licencees have access to duplex repeaters, unless adequate policing to make the service workable was provided.

2. Consideration to licensing simplex repeaters in the CBRS may well be acceptable in other areas remote from populated areas where smaller communities may well become educated to use them efficiently and accommodate the tolerance which would be unlikely to be shown in high density traffic areas.

3. Users of the service may be reluctant to forego further channel loss for such a facility as has been experienced with duplex repeaters.

The nature of this approach is that of seeking consultation without being totally negative to something which may well be found to be progressive under certain circumstances.

Should it be that the Department of Communications have any intention of introducing simplex repeaters approval for the CBRS, at least the CBers representative (or one of them) will be called upon to offer a submission. If this was to be, ACBRO Inc. would be desirous of being informed of the wishes of CBers and particularly its membership.

TELL US HOW YOU FEEL

So those readers of this report, who have thoughts on simplex repeaters, either for or against, should feel free at this early date to make contact with the committee of ACBRO.

At this time, the committee, despite preliminary discussions on the matter, have not formulated a policy which is known to be the feeling of those whom they represent.

There is little doubt that there would be much disagreement between ACBRO and DoTC on the views stated here, but with the knowledge of changes to their operation on 1 July, when the new "Big Brother", The Spectrum Management Agency begins operations, who knows?

It certainly looks as though 1993 is going to be an interesting year.

Hopefully ACBRO, like the boy scouts, will be prepared.

ACBRO ASSOCIATED CLUBS

Below is a list of clubs and organisations affiliated with ACBRO Inc. If you have one of them in your area, please give them your support of membership. Full details can be obtained by contacting the group of your choice from below.

For membership or affiliation enquiries please contact: ACBRO Inc., P.O. Box 170, Walkerville 5081, South Australia.

Cleveland Bay Radio Club	P.O. Box 1641, Aitkenvale,QLD 4814
SA Rotten Radio UHF Assoc.	P.O. Box 4, Dry Creek,SA 5094
LT Club Inc.	P.O. Box 626, Launceston,TAS 7250
Alpha Whisky Alpha Radio Club	P.O. Box 1457, Albany, WA 6330
Albany Communications Group	65 Hassell St. Elleker, WA 6330
Radio City Australia	26 Wootten St. Greenacres SA 5086
Pioneer Radio Association (SA)	P.O. Box 1017 Salisbury, SA 5108
Plantaganet Rep't Institute of WA	PMB 306, Cranbrook, WA 6321
Burnie Citizens Radio Club	P.O. Box 655, Burnie, TAS, 7320
Transworld CB Radio Club	90 Crozier Avenue, Daw Park SA 5041
Canning River Radio Club	53 Parkside Ave, Mt. Pleasant WA 6153
Overland Radio Club	P.O. Box 1010, Murray Bridge, SA 5235
Eureka CB Radio Club	P.O. Box 27, Reynella, SA 5161
Hackman Radio Club	P.O. Box 13, Hackham, SA 5163
Eagle Radio Group	P.O. Box 302, Morphett Vale SA 5162
Rotten Radio Group Intnl	P.O. Box 4, Dry Creek SA 5094
Broken Hill UHF Repeater Club Inc.	P.O. Box 1023, Broken Hill NSW 2880
Riverland CB Club	P.O. Box 742, Loxton, SA 5333
Gippsland Repeater Assoc. Inc.	P.O. Box 555, Maffra, VIC 3860
Murray Bridge Agric & Hort Society	P.O. Box 315, Murray Br., SA 5235
Samba Club	P.O. Box 16, Salisbury, SA 5108
Tweed Radio DX Group Intnl	P.O. Box 773, Murwillumbah, NSW 2484
The Pathfinder Radio Soc. Club	P.O. Box 24, Woodrigde, QLD. 4114
Dirty Dozen Radio Group	P.O. Box 380, Blair Athol, SA 5084
Hotel Zulu Radio Group Inc.	P.O. Box 66, Elizabeth, SA 5112
White Fox Radio club	P.O. Box 288, Salisbury, SA 5108
Mega Mouth International	P.O. Box 1534, Launceston, TAS 7250
The Triple "R's" Group	451 Regency Road, Sefton Park, SA 5083
Tru Blue Radio Group	P.O. Box 379, Blackwater, QLD. 4717
Blue O Radio Group	P.O. Box 53, Monaro Cresc, ACT 2603
Sydney Radio Group	P.O. Box 185, Gordon, NSW 2072
UHF Assoc. of WA Inc.	P.O. Box 1238 East Victoria Pk, WA 6101
Ratbag CB Radio club	P.O. Box 227, Welland, SA 5007
Sun Centre CB Radio Club	P.O. Box 912, Swan Hill, VIC 3585
Pegasus CB Radio Club	Cab 1 100 Jabez St. Broken Hill, NSW 2880
South Australia Radio	P.O. Box 162, Campbelltown, SA 5074
Port Adelaide Radio Club	P.O. Box 218, Alberton, SA 5014
Cherokee Indian Aust. Group	P.O. Box 1679, Mildura, VIC 3502
Sth. West District CB Radio Club	P.O. Box 620, Warrnambool, VIC 3280
A.M.O.S. CB Radio Club Intnl	P.O. Box 351, Broken Hill, NSW 2880
Pioneer Radio Association Aust.	P.O. Box 112, Bentley, WA 6102
Naracoorte UHF Association	P.O. Box 465, Naracoorte, SA 5271
Gosford Citizens Radio Club	P.O. Box 447, Gosford, NSW 2250
Felix Radio Club	P.O. Box 78, Goodna, QLD 4300
Inlander CB Radio Club	P.O. Box 5712, Rockhampton, QLD 4702
Aust. Red-Heeler Soc. Radio Club	P.O. Box 313, Drysdale, VIC 3222
Central West CB Radio Club Inc.	P.O. Box 628, Orange, NSW 2800
Vic Red Heeler Radio & DX Group	P.O. Box 1802, Ballarat, VIC 3354.
Kilo Romeo Circle of Friends	P.O. Box 16, Cleveland, QLD 4163
Radio Hobart Group	P.O. Box 266, Glenorchy, TAS 7010.
Welsh Dragon Radio Club	P.O. Box 581, Belmont, VIC 3216
Oscar Romeo CB Club	P.O. Box 203, North Geelong, VIC 32

Readers' Letters

IS KEN REYNOLDS WRONG?

Dear Sir,

I refer to the article by Ken Reynolds, "Antennas and SWR", in the Sept/Oct 1992 issue of CBA and feel I must express my concern at some of the statements he makes.

As an amateur operator (VK7EG) I am always trying to better understand the very complicated subject of antennas and reflections - but then, aren't we all!

Two of the best publications I have come across in this regard are the series of 7 articles in QST 1973 - 1976 by Walter Maxwell and the book by the late John Hearle, "The Easy Way". Part of Hearles book is printed in ARA Antenna Book 2 on pages 49-53 under the title "Understanding Antennas The Easy Way".

Maxwell and Hearle should be required reading for all radio writers!

On page 48 of his article Ken states that reflected power comes back down the feedline - no argument on that: BUT he then goes on to say that the reflected power goes "BACK INTO THE TRANSMITTER... AND INTO THE OUTPUT TRANSISTOR..."

Whoops!

To my mind Ken's statement is a direct contradiction of the article in ARA Antenna Book Two.

This article quotes freely from the QST series by Walter Maxwell and both are attempts to clear up a number of longstanding myths and misunderstandings among amateurs, CBers (and journalists?).

Unfortunately, although writing many years ago, Maxwell and Hearle obviously have not got their message across yet!

Walter Maxwell W2DU and John Hearle WB511R, as internationally acknowledged experts on antennas and feedlines, both state categorically that, whenever a conjugate match is present at the feel-line input, power reflected back to a transmitter is NOT re-absorbed into the O/P transistors.

It is RE-REFLECTED back in the feedline, adding to the forward power, in phase, and is again available at the antenna for radiation, less of course any resistive line loss which is minimal. Reflected power is therefore not lost! The example given in Antenna Book 2 of Maxwells 30 milliwatts into the feed line with an SWR of 4.4 giving a measured 27.1 milliwatts into the antenna proves this.

We know that a match between the source impedance (the P/A transistor or valve) is necessary to achieve optimum power transfer to the load (whatever is connected to the antenna socket).

However, without the required match (as in the presence of a high SWR) the P/A transistors will continue to produce power without being able to get rid of it, except as HEAT. Thus, to quote Ken, "Bingo, a blown final"! Not from returned power as he says - but from power which was unable to get OUT.

The SWR chart on page 49 is equally misleading (if you believe in re-reflection!) as are the calculations derived therefrom. Charts in the ARRL Antenna Book show that at 27MHz, with no SWR, 50ft of RG8 coax produces a forward loss of 0.5dB - just about 1/12 of an S point.

The chart in Ant Book 2, page 50 shows ADDITIONAL loss due to an SWR of 3:1 to be just 0.25dB - a total of 0.75dB - a 1/8 of an S point. That is just about 84% efficiency! Slightly different to the horrific picture painted by Ken's article.

I believe that too often readers are lead astray by writers attempting to simplify a difficult concept.

In this case I suggest it might have been more instructive to point out the consequences of running too high an SWR, as explained by Maxwell and Hearle.

Then describe how a good ATU or transmatch could save the day without bothering so much about SWaRing the antenna (or swearing at it).

Now THAT might be good advice to give budding CBers.

As a suggestion, how about reprinting the ARA Ant Book Two article, in full, for the benefit of all CBers. Don't edit, explain, or simplify it for your "less knowledgeable" readers. It might surprise you to find how many of them appreciate and understand the information given. It might even help dispel some of the myths so dear to their hearts and perpetuated by articles such as the one I question.

Noel Davies (VK7EG)
Burnie, Tas., 7320.

I think you're getting carried away with all this Noel. Ken's article was directed at CBers, not amateurs, not professionals - CBers.

This is not to denigrate CBers, many of whom have an excellent working knowledge of both the theory and practice of radio operation, however, as a generalisation they are not overly interested in why, but rather in what.

I hesitate to use the word pedantic in respect to your letter but I must confess that it crossed my mind. Incidentally, Ken Reynolds is also an amateur - and a professional in the field of radio comms - including antenna design.

Editor

CB ACTION CROSSWORD COMPETITIONS

Dear Sir,

Please find enclosed my attempt at your competition crossword in the current issue of CB Action.

By now you will have been inundated by clever readers pointing out the obvious omission of some lines for several of the answers, but that's not what my letter is about, although it didn't help!

As you will see from my entry there are a couple of clues left unanswered, and these are really the point of my letter.

I was able to answer virtually all of the rest of the crossword by reading the current issue of CB Action, and any reasonably intelligent sighted person should be able to do the same.

As far as I can determine, the only clues unable to be answered with a bit of reading and some common sense are these two.

Being a person who has only been "on the fringe" of radio for many years and never quite had the time or disposable funds to get as involved as I would like, I am fairly unlikely to know the answers to these questions (in fact a couple of full call amateur mates don't know either - maybe they're no good at crosswords).

So without spending a lot of time (which I don't have) and effort I am prevented from entering your "contest" to win a scanner which I would enjoy using alongside my PRO-2022.

It seems to me that the very nature of the "contests" which you run from time to time do not encourage newcomers and/or fringe dwellers like myself to enter, so the prizes probably go to people who are already established in a most fascinating hobby, rather than to someone who is yet to get "hooked".

Instead of having entries contingent on some small piece of specialist knowledge, wouldn't it be better to simply allow all your readers equal access, newcomer, novice or old hand?

For those who have something to prove, print them a crossword as well. I have no big axe to grind on this topic, but I suspect it has simply never been thought through from the absolute beginners viewpoint, and unless someone points it out I guess you'll never realise it.

I have been a reader of both your publication and sister publication ARA for some years, and have often wondered why the two are not combined.

Constantly there is comment in both magazines about the threats of encroachment on bands from other high volume users such as the cellular phone networks, etc., and I feel that combining the two magazines (perhaps maintaining separate sections) would help to get more people involved in radio generally and amateur bands in particular.

From the publisher's point of view though I suppose two magazines generate more income.

Keep up the good work as I do enjoy your magazine and hopefully one day I will have a bit more time to put some of the knowledge to work.

Laurie S. Davidson,
Nambucca Heads, 2448.

Laurie, somewhere along the way you have missed the point. You are quite correct when you say that most of the answers can be found by simply reading this magazine, however, the few answers which are not contained within the magazine are, let's face it, pretty basic.

If I wanted to win the scanner I would make it my business to find the answers rather than asking for a more simple contest.

Your suggestion of combining CBA with ARA is, I regret to say, naive...something along the lines of suggesting to the Federal Labor Party that they combine their newletters with those of the Liberal Party.

While CBers and amateurs have mended many of the bridges created when 11m was removed as an amateur band and given to CBers, the combining of the two publicatiuons would simply alienate readers of both.

Sure there is a degree of "crossover" between the two but there is no way that we would ever consider merging the two titles.

Editor

"JUDICIOUS REX" WHERE ARE YOU?

Dear Sir,

I am writing to you to ask whether there is any likelihood of having the article written by "Judicious Rex" in Amateur Radio Action, Vols 15 #11 and #12, repeated in the sister magazine CB Action, as I feel it may have a deterrent effect on the ratbag element which continually spoils our hobby.

Also I, and I'm sure plenty of other hobby radio enthusiasts, would like to know how the new Act is going to affect Citizen Band Radio users. Will the "mandatory prison" penalty apply to all, or is it specifically pertaining to "commercial operators" (I hope I read that right). I feel a repeat of the ARA article would be a great help to the thousands of CBers who are ignorant of the laws pertaining to our hobby, let's face it, the legislation is written in such a way as to confuse as many as possible with the exception of the legislators and legal fraternity.

Maybe "Furious Fewster" could write a column on the new Act and give us his opinion regarding it, after all, it must have some effect on his business, especially if there is the likely event that scanner and short wave listeners will be licenced...which will probably see more people giving the hobby away. If I read the article correctly, "Judicious Rex" said that stores will have to make sure they see a licence before selling the equipment. As an invalid pensioner, I already battle to make ends meet on my meagre pension (and that is not a gripe).

I purchased all my equipment when I was employed before I had my accident. Prior to taking up the hobby of CB I used to sit in my wheelchair and stare at the walls most days and I suffered from boredom and depression.

So the hobby of CB radio has given me back my means of communication with others, which any normal (define that) person would do in their working day. So to get back to my original plea, is it going to be possible to twist the arm of "Judicious Rex" and ask him to interpret how the new Act will affect CBers. Thank you.

(Name and address supplied)

Thanks for the letter, however, I'm afraid that the bad news is that the new laws are not aimed at "commercial operators" only - they are directed at everyone - CBers, scanner owners, short wave listeners, amateurs - you name it and they will have to conform with the new requirements.

Draconian though the penalties are, the end result will probably be better for all concerned as it will only take a couple of well-publicised "busts" to smarten everyone's ideas up very quickly indeed.

You'll find the report you asked for elsewhere in this issue and we will probably look further into the situation in our next issue. **Editor**

DXinternational

By Jack Haden

Most of us who have passed the 200 countries confirmed mark will be finding it much harder to snap up that elusive new one, let alone confirm it.

Good equipment, a reasonable knowledge of propagation, and of course, being there, all helps to procure another much needed new country or two.

It is a case of some DX being better than no DX, or more a case of being there, on the band, around the right frequency, at the right time.

Nobody likes erratic band conditions, nothing worse than sitting up late at night expecting the band to open to some far off country only to find that conditions have changed.

Numerous reports have filtered through to my desk over the past couple of months concerning stations in the former USSR "asking" for a minimum of $US2 for return postage and "handling" expenses for QSLing purposes.

A letter that arrived here in January stated that a particular station is asking the handsome sum of US$5 per card, a bit rude in anyone's book.

However, if you need the country confirmed badly enough then I guess you will just have to take the risk and send the money or funds required and keep your fingers crossed in the hope that you get a card back. You could always hang off in the hope of working another station in the same country required for a cheaper price!

With uncertainty surrounding the Australian dollar, the hobby of DX QSLing is becoming more of a luxury for some. Try buying even a measly US$10 in American currency and see what it costs you in Australian dollars — I guarantee you will not be smiling.

Interestingly enough, an increasing number of former USSR countries are now opting for overseas QSL Managers to handle their cards.

These managers are mainly based in Italy, France or the US, the reason being that local postal workers have cottoned on to the racket and have been "extricating" the contents of any mail particularly with callsigns on envelopes. This is common practice in many South American and African countries.

So although QSLing will be one of the hardest areas of DXing on the 11-metre band, don't think it's any easier on the amateur band. Callsigns on envelopes are always a no-no, to Third World countries especially, and that situation is unlikely to change for some time.

CENTRAL/SOUTH AMERICA & CARIBBEAN SEA

Quite a lot of activity has been logged and noted from this region in the past few weeks with excellent signals to match, not much in the way of new ones have been observed on the band but still enough semi-rare DX stations about to keep us at the radio.

Brazil has been well represented on the band, station 3-YK-110 was logged at 0330z with a healthy five by nine plus 10db report.

He was closely followed by 3-BR-101, operated by Alfonz, with a good five by eight report.

Argentina is about in abundance with 4-DX-63, operated by Rudi, leading the way from the capital Buenos Aires and at 0004z Alfonz was a good five by six report. Numerous Alfa Tango stations from Argentina were also about at the time.

Paraguay was heard via 67-AI-01, name unknown. At 1935z he was calling for Australia and the Pacific with a good five by six report but was getting no replies for some reason, perhaps everyone has Paraguay confirmed.

French Guyana was logged by way of station AA-120 operated by Louis. At 0115z he was a good five by five report and ended up working stations in New Caledonia when his calls in English went unanswered.

Louis is located in Cayenne, the capital.

Ecuador is always around when the South American path is open and at 0156z a nice five by nine signal came from 61-GCI-101, operated by Carl.

At the time, Carl was looking for a contact in Indonesia and appeared to ignore calls directed to him from Australia and New Zealand at the time.

Bolivia has been about for those who still need this difficult to confirm country. This is a definite no callsign on envelope destination. At 0311z I logged BR-2001 operated by Manuel, who was a good five by eight report but heavily over modulated, either running his speech processor to death or a vile sounding power microphone I think.

Costa Rica is usually about the bands for those who need it. At 2151z I heard the 69-CR-106 operated by Al with a good five by seven report from Heredia.

Al was looking from a fellow Costa Rican now living in Melbourne, Australia.

Bermuda was heard loud and clear at 0211z by way of EXPRESS-101 operated by Ken at Hamilton, on Bermuda Island. Ken was a good five by nine plus 20Db at the time.

British Virgin Islands was logged at 2345z with the appearance of AZ-106 operated by Tom on the band, Tom was a poor five by two from this location at Tortola on the main island.

The US Virgin Islands was noted at 0401z by way of DX-1099 operated by Vinny.

She was a good five by six at the time and was looking for her friend in Australia. Vinny stated clearly that she doesn't QSL at all.

Trindad & Tobago was noted by way of KP-360, name unknown. At 1100z it was a fair by five by three report.

Aruba is still around for those who still need this one, at 1942z station 232-BB-01 was heard with a fair four by three report, I often wonder what has happened to all the "Flying Eagle" club members that used to be so numerous on the band from Aruba?

San Andres Island was logged at 2333z by way of Spanish speaking station "1985", name unknown.

He was calling for any station in Colombia that could hear him and ignored calls in Spanish and English from elsewhere.

continued over page...

MIDDLE EAST & ARABIA

Not a great deal of surprises from this region, sporadic conditions and a lack of regular operators puts a damper on looking in this direction.

Saudi Arabia was logged by way of 48-AC3/4101, operated by Ahmed, at 0844z with a poor three by three report.

He was followed by 48-ZZ-03 operated by Nel. At 0912z Nel was a fair five by two report with heavy fading at the time.

Qatar is still around on odd occasions with 115-RQ-101, name unknown, being the most active.

At 1055z he was a good five by nine report, also from Qatar 115-AB-98 has been heard from time to time with varying signal reports. The United Arab Emirates makes the odd appearance on the band usually by way of 94-UA-16, name unknown.

He was heard at 1615z via the longpath with a five by six report. There is also a couple of Alfa Tango stations active from time to time in the UAE.

Kuwait seems to have quite a large 11-metre band population now thins have more or less settled down again. Commonly heard are 102-AB-104, 102-AT-121, 102-AT-125, 102-KWT-01 and 102-WAC-2408 among others.

AFRICA & INDIAN OCEAN REGIONS

Band conditions to this part of the world have not been good, although the "gang" in Europe seems to have little trouble in working this region on a regular basis and, of course, snaps up any new countries that should appear.

A good directional antenna and a watch on both the long and shortpaths around an hour or two before sunset and of course well after sunset should reveal a signal or two.

South Africa was logged by way of 44-NF-109 operated by Peke. At 0511z, Peke was a fair four by two report and was working a station on Reunion Island.

Not long after I logged 44-SA-100 operated by Della and she was a fair four by four report but fading heavily. Della resides in Cape Town.

Namibia was heard at 0641z with a very poor signal report of three by zero belonging to station 74-KK-?? (I didn't get the rest). The signal never improved from this despite changing antennas and directions etc.

Zambia was represented on the band by way of a mobile station belonging to Peter who operates as the SAFARI-01-MOBILE. At 0700z Peter was a good, but noisy, five by three report.

Zimbabwe had a poor signal on the band from one of the "Flame Lily" club members 85-FL-?, at the time 0741z the signal was virtually useless here. Still it proves there are stations about from Africa. The Maldive Islands capital of Male was heard by way of 707-RM at 0359z, operated by Case. He was a good five by three at the time and was looking for his mate in Jakarta, Indonesia.

EUROPE

Most of the regulars are there with each opening to the European continent — Italy, France, Belgium, The Netherlands etc., etc., are always there, so too are the "ooooohhlaah" fraternity with their constant moaning on the call frequencies.

Most European DX activity is now concentrated on the new republics of the old Yugoslavia and the new parts of the old USSR.

Byelorussia was noted on the band by way of the following stations, among others: 317-KB-210 at 1018z operated by Igor with a five by eight report, 317-AT-102 at 0830z with a five by five report, and finally 317-WR-101 at 0833z with a five by six signal.

European USSR is still with us and more operators seem to be coming onto the 11-metre band. Just a few observations on the band yielded 50-AZ-101, Alex, 0912z five by five; 50-UR-03, Vlad, 0938z five by nine plus 10db over; 50-MB-002 Oleg at 0811z five by nine plus; 50-OPDX, 50-SL-115 and 50-AT-103 seem to be the most active from this area.

Latvia is always about too and by now most of you should have these well and truly in the bag: 310-KT-009 operated by Alex, 1000z five by eight; 310-AT-102 at 1005z five by nine; 310-LV-109 operated by Alex, 1000z five by eight; 310-AT-102 at 1005z five by nine; and 310-LV-109 operated by Tom at 1022z five by three peaking six.

Lithuania seems to be reasonably active too with the following being observed more or less on a regular basis: 311-ALDX at 1045z five by seven, also 311-AZ-102 operated by a Mr Yuri at 1017z and a three by seven report.

Seems Mr Yuri needs to wind things back a wee bit as his modulation is bloody horrible to say the least.

Ukraine seems to have the largest 11-metre band throng of operators.

The following stations have been noted: 315-AT-102, 315-AT-112, 315-AT-111, 315-AV-01, 315-UK-101, 315-UY-001, 315-UR-103 among a few others heard but not as regular as those just mentioned.

Croatia seems to have a few ops active on 11-metres.

The 327-CR-001 was logged at 0806z five by six report, also noted was 327-AB-101 operated by Nik.

At 0911 he was five by six, and 327-DX-001, op unknown, at 0945z with a poor three by three report.

Dave the 43-DE-09 here in Australia tells me that a slanging match took place between 45-AT-101 and 327-CR-001 about whose country was in existence and whose wasn't, arguments that we can well do without on 11-metres.

Yugoslavia is still most active on the bands with the following being placed in the logs: 45-AT-101, 45-AT-113, 45-DC-108 and 45-DT-01 in the 0645z to 1130z time slot

Malta was about the band by way of 93-NI-7 operated by Neil in Valletta.

At 0711z Neil was a fair five by two report and had faded right out by 0718z.

Also from Malta I heard the 93-XT-100, op unknown, at 0738z it was a virtually unreadable three by zero report.

Monaco has been around by way of 107-AT-104, at 0915z, who was logged at a three by three report. QSL route for this one is via 14-AT-511 in France.Cyprus pops up now and again and at 0700z on the knocker I noted 110-DX-100 operated by

DXinternational

Kal, at a steady four by three report.

Quite a pile-up from this region soon started.

QSL via Kal's home address in the United Kingdom and be prepared to wait until he returns there in three months before cards are answered.Balearic Islands are reasonably common on the band if you still are needing this one.

At 0645z I logged 49-WD-206 operated by Sal with a three by three report. He was followed by 49-ST-109 operated by Serge at 0653z five by six report. Also heard 49-ABR-12 and 49-AT-170

ASIA & THE PACIFIC REGION

The normal rabble from our Asian neighbours is always about, but this shouldn't deter the keen DX34 from checking the band out.

With amateur radio operations approved in North Korea be prepared to hear a signal or two possibly on 11-metres from North Korea in the not too distant future, but of course, beware of "slims" doing the rounds too!

Fiji was noted at 2045z by way of Sita operating as SK-201 out of Ba Village on Viti Levu Island.

Solomon Islands were heard by way of station H-44 operated by Keith near Honiara, the capital. At 2158z Keith was a good five by eight peaking at nine. Keith doesn't QSL.

ABCDEFG
HIJKL N
OPQR TU
VWXYZ
With more research it could disappear forever.

MS
Multiple Sclerosis.

The Kingdom of Tonga is usually about the band by way of three operators with a variety of callsigns, one of the most active would be PACIFIC STAR operated by Sale.

At 0006z he was a three by five from Nuku'alofa, the capital.

Norfolk Island was logged by way of NI-106 operated by Pat, at 1038z Pat was a good five by six report. I

n answer to a couple of letters, yes, Norfolk Island is active on the 11-metre band, often I have heard the odd station calling on channel 35 lower or on odd occasions on 16 lower in the 40-channel allocation.

The Federated States of Micronesia are most active, particularly Chuuk Island (formerly known as Truk).

At 0948z I logged Kn-531 who was a good five by five, also I heard Al, who signs as the WC-1068 and at 0432z was a good five by nine plus 20db over.

The island of Kosrae (formerly called Kusai) was logged with Esna, who signs as the UNIT-51 on the band.

Esna was five by five at 2230z.

Pohnphei (formerly called Ponape) was noted at 2345z by way of Ari signing as KC-3066 portable (aboard a fishing vessel). Ari doesn't QSL.

The Mariana Islands are always about for those who need this one.

Most of the operators are based on Saipan and a fair few of them are Filipino contract workers on the island and use their 11-metre band sets to get back to the Philippines stations that work DX.

The ones that I have noted are 133-AT-101 and 133-AT102 and they can be found around the usual traps.

Georgia has been heard by way of the following: 306-GO-101 operated by Alex, at 0913z was five by five, 306-AT-106, name unknown, at 0900z five by seven (demands a minimum of US$2 per card so give him a miss!) and a few others too numerous to note.

Kazakhstan is usually about by way of active operators: 308-ON-101 noted at 1020z with a good five by eight report, and 308-KZ-103 operated by Yuri logged at 1033z five by nine plus 10db over.

Tadzhikistan has many stations on the air and must be one of the most populous of the former USSR republics on the 11-metre band. Beware of the US$2 brigade here too.

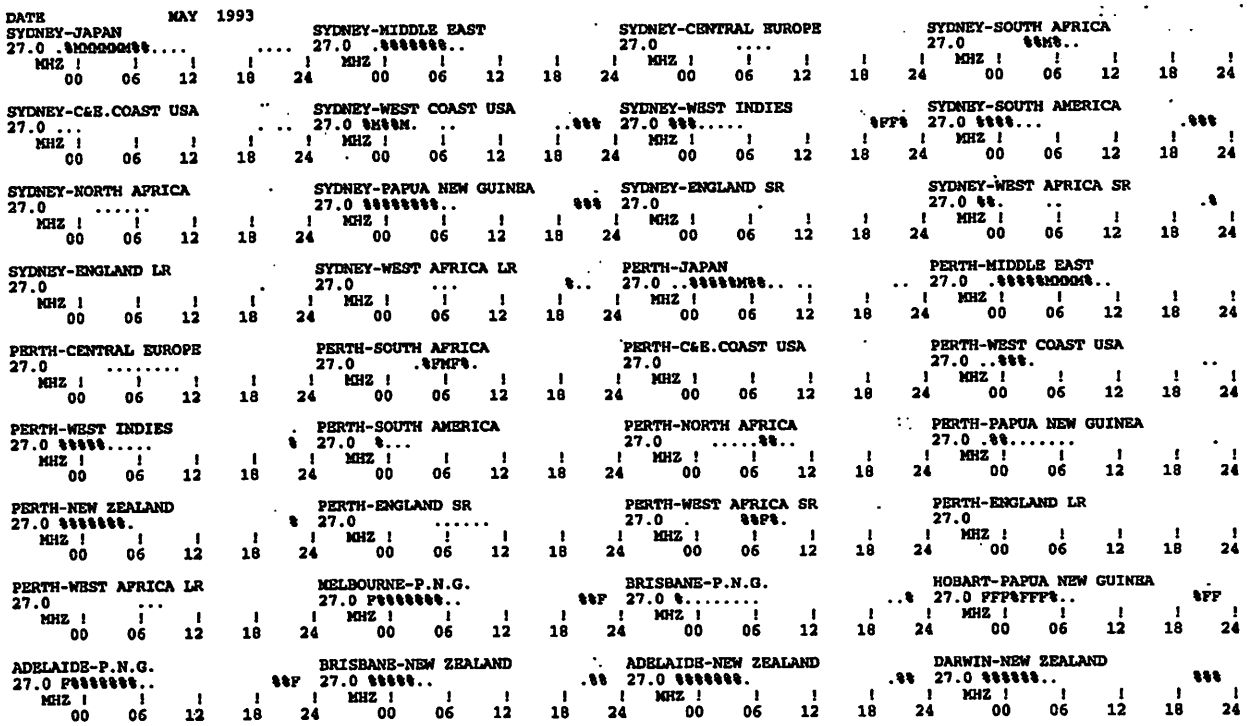
Turkmenistan has been logged by way of 314-AT-101, name unknown, at 0620z with a five by three report.

Also DXpedition 303-AT-103/314 was logged at 0740z, QSL via 35-AT-139. Another heard was 314-AT-103, name unknown at 0711z was a poor three by one.

Uzbekistan pops up on the band from time to time.

I logged the following, among others: 316-UZ-101 operated by Igor at 0955z five by six; 316-UZ-111 operated by Veca at 1017z five by nine; and also reported as active, 316-AT-101 and 316-AB-104 operated by Nik.

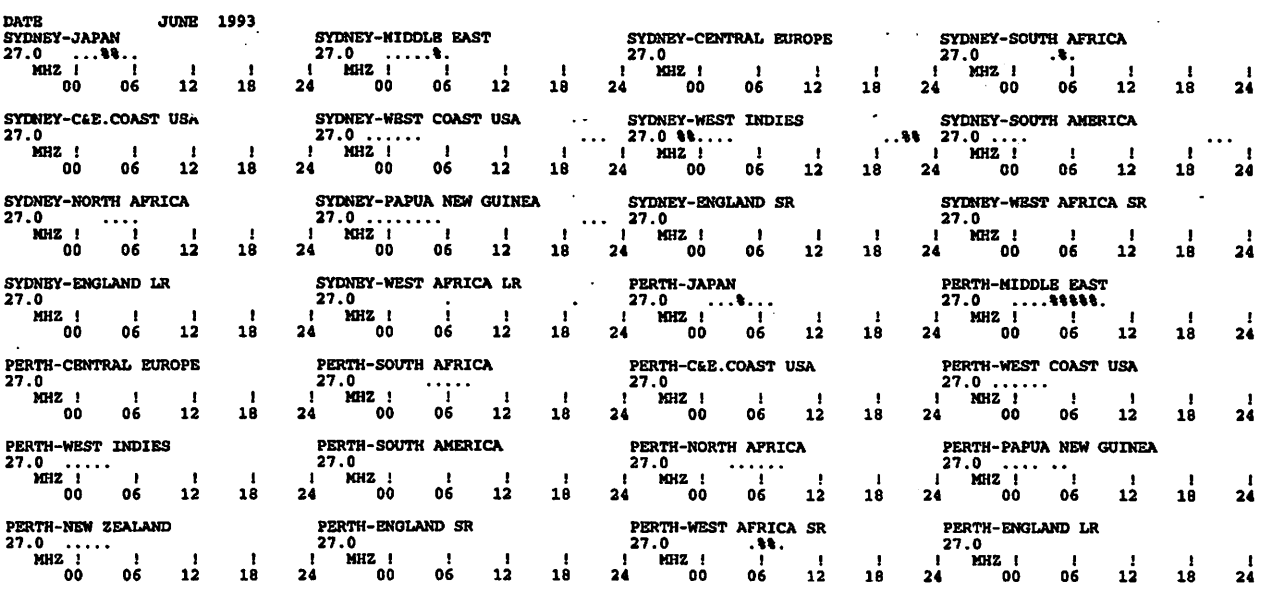
That's all I have for this DXI,
thanks to those who kept me informed both via the mail and the phone.
Special thanks go to Dave, 43-DE-09 who sent in quite a wealth of notes.



These GRAFEX style predictions present in pictorial form the expected HF propagation conditions between Australia and a number of DX areas. For each circuit, the "East" terminal refers to the eastern half of Australia. The horizontal axis of each graph represents the hours of the day in Greenwich Mean Time (UTC) from 0000 to 2300, reading left to right. A GRAFEX symbol represents the predicted propagation conditions for 11m at a particular time.
GRAFEX Prediction Charts are supplied courtesy of the Ionospheric Prediction Service, 162-166 Goulburn Street, Darlinghurst, NSW.
IPS offers pre-recorded telephone information on (02) 269 8614.

LEGEND TO GRAFEX SYMBOLS

. Propagation is possible but probably on less than 50% of the days of the month.
% Propagation is possible on between 50% and 90% of the days of the month.
F Propagation is possible by the F modes on at least 90% of the days of the month.
E Propagation is possible by the E modes on at least 90% of the days of the month.
M Propagation is possible by both the First and Second F modes on 90% of the days of the month.
S Propagation is possible by the Second mode on 90% of the days of the month.
A High absorption - above the ALF but probably too close to it for good HF communication.
X Complex mixture of modes including the Second E mode.



Here's a second opportunity to...

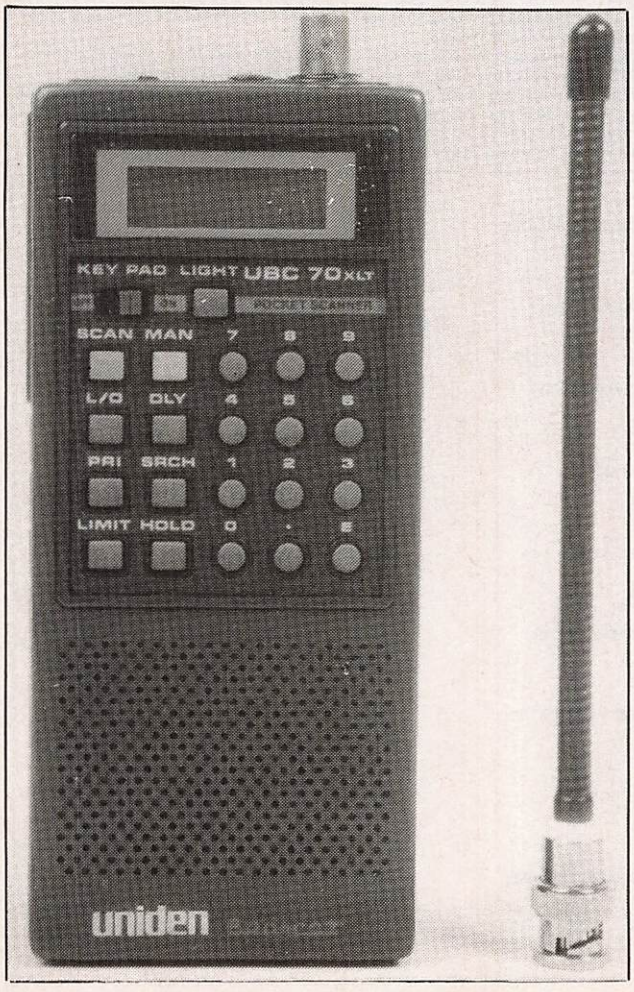
WIN A BEARCAT 70XLT SCANNER

Courtesy of Dick Smith Electronics

In his inimitable fashion, Murphy struck once again when he blatantly removed the last line of our March/April competition crossword from the last issue of CBA.

Even so, we received a large number of entries from readers who simply added the last line of squares themselves themselves.

In fairness to everyone, however, we have held all the entries already received from the March/April issue and now give everyone, including those whose entries we have, another chance at the scanner.



This issue's crossword contains many of the clues from the March/April issue, however, all entries for this issue's crossword will be mixed with those we already have and a winner will be drawn from the combined total. If the first envelope opened is for the March/April issue and it has the correct answers for the missing squares, that reader will be the winner.

If those who have sent in their entries also want another chance, they can have a go at this issue's crossword - that way they have two chances for the scanner.

We can but offer our apologies for dropping the last line of squares off the crossword grid - let's face it, we at least managed to get all the clues in there correctly!

Dick Smith Electronics has supplied the Xword prize - a well worth winning Uniden 70XLT handheld scanner. Reviewer Rob Williams reckons that it's a real "pocket rocket", ideal for both the newcomer to this interesting hobby and the old-hand with a drawer full of frequencies. The Xword questions certainly are not all that difficult and the answers to many of the clues can be found somewhere in this issue.

There are, however, a few clues for which you will have to chase the answers elsewhere, but overall, it really is all pretty simple.

While there is only one first prize, we will also give six issue subscriptions to the next two correct entries opened after that of the winner.

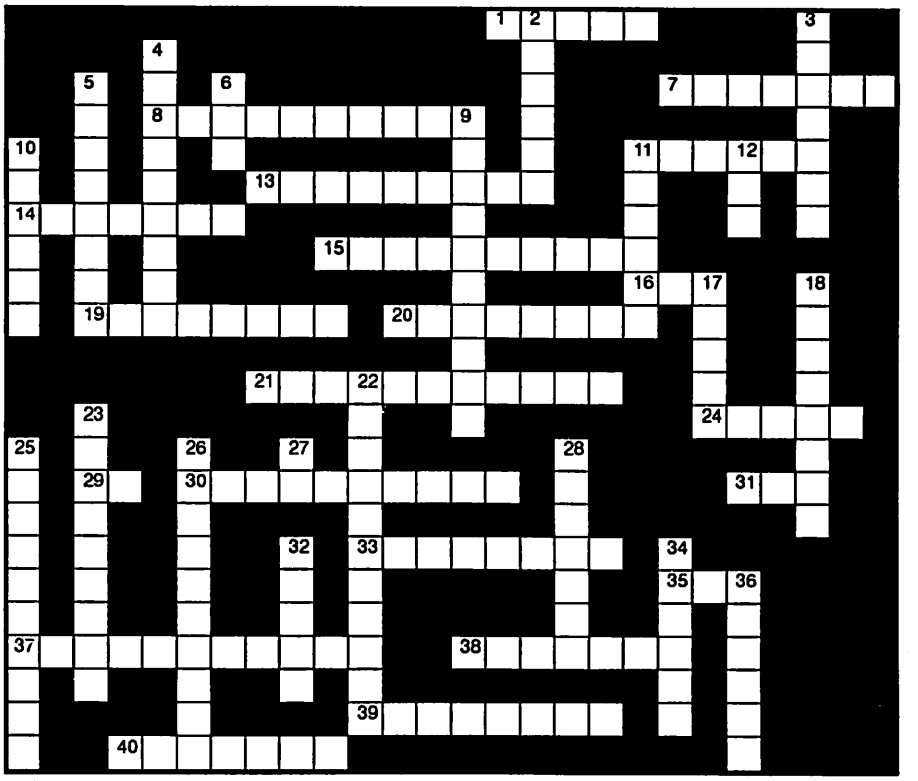
All entries must be received at the address on the coupon opposite no later than 21 May and, subject to the comments made earlier about March/April entries, the winner will be the first correct entry opened.

It must be stressed that all entries must be on the actual page opposite - photo-copy entries will not be elegible. The entries will be opened in the CBA editorial office and the winner will be advised by telephone with the scanner being delivered by courier a few days later.

Subscription winners will be listed in the July/August issue and their names placed on our subscription list. I hope we got it right this time - and best of luck!

HERE'S YOUR CHANCE TO WIN A BEARCAT 70XLT

Courtesy of Dick Smith Electronics



CLUES ACROSS

1. (Name?) Manson is one of CBA's advertising managers.
7. One type of repeater is referred to as "duplex," what's the other one?
8. A Commex model.
11. The Acbro associated "Felix Radio Club" is based in what Queensland town?
13. An amateur transceiver which covers both the 2m and 70cm bands is generally known as a (what?).
14. What company manufactures the ATS-606P multi-band portable receiver?
15. You would need this function to reduce the strength of a very strong signal being fed to your receiver.
16. A unit of resistance.
19. The name of the Melbourne based radio-oriented BBS.
20. What's the WA taxi code for "police in vicinity"?
21. Who wrote the article on SWR in this issue, (3,8).
24. You should always ensure that you have a good (what?) on your transceiver.
29. The suffix of Chris Edmondson's VK3 callsign.
30. What's the name of our contributor who lives at Kallangur in Queensland, (3,7).
31. A well known make of scanner.
33. If your antenna was pointing 180 degrees to a shortpath heading you would be working a (what?) heading.
35. The name of a well know frequency register.
37. A West Australian 1/31 UHF repeater is located here.
38. Greg (who?) writes the "Bandspread" column.
39. When listening to a scanner, you could be said to be (word?) the channels.
40. Name the editor of this magazine, (3,4).

CLUES DOWN

2. Some antennas are referred to as a (what?) duckie.
3. Selective Calling.
4. Name the company that manufactures the SC Base Scanner antenna, (6,3).
5. What's the main subject of Paul Butler's article in this issue?
6. If you were transmitting on ch 35 (27MHz service) what mode would you probably be using.
9. Radio inspectors are sometimes called this, (3,7).
10. Arthur (surname?) is the author of "Passport To World Band Radio" reviewed in this issue.
11. Terry (surname?) asked Rob Williams for assistance on an SX-190 receiver in this issue.
12. What's the suffix of Paul Butler's callsign?
17. 27MHz is also known as the 11 (what?) band.
18. What's the brand name of the MVT-7100 handheld scanner?
22. What's the name of the person who wrote about the SMA in this issue, (3,8).
23. What's the name of the person who writes our "DXinternational" column, (4,5).
25. In the abbreviation "SMA," the "M" stands for what?
26. IPS supplies our 27MHz propagation chart - what does the "P" stand for..?
27. Richard Jary writes the "(what?) Utilities" column.
28. What does the "V" in the term VSWR stand for..?
32. A well known association of CBers.
34. The make of antenna rotator reviewed in this issue.
36. Some antennas need a (what?) plane to operate properly.

The solution to this crossword will be published in the next issue.

ADDRESS YOUR ENTRY TO:
CB XWORD, P.O. Box 628E, GPO, Melbourne 3001

NAME.....ADRESS.....

.....'phone ( ).....

ENTRIES MUST BE ON THIS PAGE - NO PHOTOCOPIES

AUSTRALIAN UHF REPEATER LIST

NOTE: Corrections and updates may be sent to:
CBA Repeater Listing, P.O. Box E160, St James, NSW 2000.

ACT

Canberra	2/32
Canberra	8/38

NEW SOUTH WALES

Albury	6/36
Armidale	4/34
Barraba	6/36
Bathurst	8/38
Bega	6/36
Belbora	1/31
Binya	3/33
Blue Mountains	2/32
Bombala	8/38
Booral	7/37
Bowral	6/36
Braidwood	3/33
Brewarrina	1/31
Brindabella Ranges	7/37
Broken Hill	4/34
Broken Hill	7/37
Buladelah	7/37
Casino	6/36
Cobar	8/38
Coffs Harbour	6/36
Coolah	6/36
Cooma	4/34
Coonabarabran	4/34
Corowa	2/32
Corowa	5/35
Corwa	7/37
Deepwater	5/35
Deniliquin	1/31
Dungog	3/33
Eden	2/32
Glen Innes	7/37
Grafton	8/38
Grenfell	1/31
Gundagai	7/37
Gunnedah	2/32
Guyra	1/31
Warden	1/31
Hampton	1/31
Hay	4/34
Inverell	2/32
Jindabyne	1/31
Junee	5/35
Kariong	8/38
Lismore	2/32
Manilla	3/33
Monkey Hill	6/36
Mt Lambie	2/32
Murrirundi	3/33
Muswellbrook	4/34
Narrabri	2/32
Narranderra	8/38
Narromine	5/35
Narromine	6/36
Newcastle	1/31
Newcastle	2/32
Newcastle	5/35
Newcastle	6/36
Nundle	7/37
Orange	3/33
Port Macquarie	2/32
Sydney	5/35
Sydney (south)	1/31
Sydney (west)	3/33
Sydney (outer-west)	4/34
Sydney (north)	7/37
Tamworth	4/34
Tenterfield	3/33
Tumbarumba	3/33
Tumut	6/36
Tweeds Heads	4/34
Wagga Wagga	1/31
Wagga Wagga	5/35
Walbundrie	2/32
Walcha	2/32
Walcha	6/36
Walcha	8/38
Warrumbungles	1/31
Wingham	1/31
Wilcannia	1/31
Wollongong	8/38

NORTHERN76 TERRITORY

Bushy Park	1/31
Darwin	1/31
Erldunda Station	3/33
Katherine	2/32
Marywale Station	4/34
Mt Swan	2/32

Queensland

Alpha	2/32
Atherton	8/38
Amiens	8/38
Ayr	3/33
Barcaldine Downs	1/31
Bathurst Heads	1/31
Bauhina Downs	4/34
Biloela	7/37
Blackall	8/38
Blackwater	6/36
Brisbane	1/31
Brisbane	5/35
Brisbane	7/37
Bundaberg	4/34
Bundaberg	7/37
Cairns	3/33
Chinchilla	8/38
Clermont	6/36
Clermont	7/37
Crows Nest	6/36
Dimbulah	6/36
Dirranbandi	8/38
Double Island Point	3/33
Edward River	3/33
Emerald	8/38
Gladstone	6/36
Gold Coast	3/33
Goondiwindi	4/34
Gympie	2/32
Gympie	5/35
Gympie	7/37
Hervey Bay	8/38
Hughenden	1/31
Ingham	2/32
Inglewood	1/31
Innisfail	1/31
Ipswich	4/34
Jericho	4/34
Kilcoy	3/33
Lakeland Downs	2/32
Longreach	3/33
Mackay	3/33
Mackay	6/36
Marlborough	2/32
Maryborough	6/36
Maxwelton	2/32
Miles	6/36
Monto	3/33
Moranbah	4/34
Moura	1/31
Mt Isa	1/31
Mundubbera	6/36
Murgon	7/37
Quilpie	2/32
Rockhampton	1/31
Rockhampton	4/34
Roma	1/31
Springsure	3/33
Sunshine Coast	6/36
Sunshine Coast	8/38
Tambo	6/36
Taroom	2/32
Thargomindah	6/36
Toowoomba	2/32
Toowoomba	4/34
Townsville	1/31
Townsville	4/34
Wavell Heights	2/32
Warwick	1/31
Wide Bay	1/31
Yaraka	7/37

SOUTH AUSTRALIA

Adelaide	5/35
Angaston	4/34
Blinman	3/33
Carrietown	1/31
Ceduna	1/31
Clare	7/37
Cleve	2/32
Coonalpyn	6/36
Coppudurba Hill	1/31
Crystal Brook	1/33
Hawker	7/37
Kangaroo Island	4/34
Murray Bridge	8/38
Mt Bryan	8/38
Mt Gambier	5/35
Mt Gambier	7/37
Myponga	2/32
Naracoorte	4/34
Orroroo	2/32
Port Lincoln	8/38
Port Pirie	4/34
Renmark	6/36
Snowtown	6/36
Tarcoola	6/36
Wilkatana	8/38
Yorketown	7/37

TASMANIA

Burnie	8/38
Central Highlands	7/37
Devonport	1/31
East Coast	6/36
Flinders Island	1/31
Hobart	1/31
Hobart	5/35
Launceston	2/32
Launceston	6/36
Midlands	4/34
North East Coast	3/33
North West Coast	4/34
North West Coast	6/36
Sandfly	2/32
West Coast	2/32

VICTORIA

Alexandra	1/31
Ballarat	2/32
Ballarat	5/35
Bairnsdale	7/37
Beech Forest	3/33
Bendigo	4/34
Cavendish	8/38
Currajung	4/34
Echuca	6/36
Euroa	3/33
Falls Creek	3/33
Foster	6/36
Geelong	4/34
Halls Gap	6/36
Hamilton	5/35
Harcourt	8/38
Hawkesdale	4/34
Horsham	3/33
Kerang	2/32
Lavington	4/34
Mansfield	2/32
Melbourne (north)	1/31
Melbourne (metro)	3/33
Melbourne (metro)	5/35
Melbourne (south)	7/37
Mildura	3/33
Moe	2/32
Mornington Pen.	8/38
Mortlake	7/37
Mt Cann	8/38
Mt Concord	6/36
Mt Delegate	3/33
Mt Terrible	8/38
Myrtleford	8/38
Penshurst	1/31
Shepparton	7/37
St Arnaud	1/31
Swifts Creek	1/31
Talangatta	7/37
Wangarrata	6/36
Waubra	7/37

WEST AUSTRALIA

Albany	3/33
Augusta	7/37
Bencubin	2/32
Boyup Brook	4/34
Bunbury	2/32
Carnamah	2/32
Carnarvon	2/32
Coolgardie	7/37
Darkin	6/36
Denmark	1/31
Esperance	4/34
Kalgoorlie	2/32
Kambalda	1/31
Katanning	1/31
Kellerberrin	1/31
Kulin	4/34
Lancelin	4/34
Mandurah	7/37
Manjimup	6/36
Margaret River	6/36
Meekatharra	1/31
Merredin	2/32
Mia Mia	1/31
Mt Manypeaks	6/36
Mt Barker	5/35
Mt Barrow	7/37
Mt Saddleback	1/31
Mt Solus	4/34
Nannup	2/32
Perth	1/31
Perth	3/33
Perth	5/35
Perth	8/38
Ravensthorpe	8/38
Stirling Ranges	7/37
Wickham	1/31
Wongan Hills	8/38
Wyalkatchem	6/36
York	7/37

UF2020

ON THE RIGHT TRACK

AUSTRALIAN DESIGNED

40 CHANNEL UHF WITH *SCANNING*

TWO PIECE REMOTE MOUNTABLE

PEARCE-SIMPSON®

HATADI ELECTRONICS CORPORATION AUSTRALIA PTY. LTD. (A.C.N. 0034318010)
5 APOLLO ST., WARRIEWOOD, N.S.W. 2102 Phone: (02) 997 7077 Fax: (02) 99 1229

RAISING THE STANDARD

AUSTRALIAN DESIGN AND MANUFACTURE

GME Electrophone

TX4000 SERIES UHF CB RADIO

WITH BUILT IN MULTI-TONE CCIR SEL-CALL

TX4000 LOCAL

TX4000R CONTROL HEAD

- INTEGRATED SEL-CALL
- HIGH SPEED PROGRAMMABLE SCANNING
- REMOTE OR DASH MOUNTED OPTIONS
- LIQUID CRYSTAL DISPLAY
- FRONT MOUNTED SPEAKER
- ELECTRET MICROPHONE
- SIGNAL STRENGTH METER
- SELECTABLE DUPLEX FUNCTION

ALL CB'S ARE NOT CREATED EQUAL

Distributed via National Dealer Network by:

GME Electrophone

A DIVISION OF STANDARD COMMUNICATIONS PTY. LTD.

SYDNEY (02) 816 4755, MELBOURNE (03) 584 8099,
BRISBANE (07) 273 4355, ADELAIDE (08) 234 2633,
PERTH (09) 330 5322, AUCKLAND (09) 274 0955